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# INTERNATIONAL MEDICAL DIGEST



Vol. I

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No. 1

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## JOURNALS ABSTRACTED

Acta Scholæ medicinalis universitatis imperialis in Kioto  
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Allgemeine Zeitschrift für Psychiatrie  
American Archives of Neurology and Psychiatry  
American Journal of Diseases of Children  
American Journal of Electrotherapeutics and Radiology  
American Journal of Insanity  
American Journal of Medical Sciences  
American Journal of Physiology  
American Journal of Psychology  
American Journal of Public Health  
American Journal of Roentgenology  
American Journal of Syphilis  
American Review of Tuberculosis  
Anales de la Facultad de Medicina de Lima  
Annales de médecine  
Annales medico-psychologiques  
Annali di freniatria e scienze affini  
Annals of Tropical Medicine and Parasitology  
Année électrique, électrothérapeutique et radiographique  
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Archives de médecine et de pharmacie militaires  
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Archives des maladies de l'appareil digestif et de la nutrition  
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Archives de médecine des enfants  
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Archives of Internal Medicine  
Archives of Neurology and Psychiatry  
Archives of Pediatrics  
Archives of Radiology and Electrotherapy  
Archivos de criminologia  
Archivos españoles de pediatria  
Atlas of Stereoroentgenology  
Atti del Congresso italiano di radiologia medica  
Berliner klinische Wochenschrift  
Biochemische Zeitschrift  
Boston Medical and Surgical Journal  
Brain: A Journal of Neurology



Brazil-medico  
Bhistol Medico-Chirurgical Journal  
British Journal of Dermatology and Syphilis  
British Journal of Children's Diseases  
British Journal of Psychology  
British Journal of Tuberculosis  
British Medical Journal  
Bulletin de l'Académie de médecine  
Bulletin of the Johns Hopkins Hospital  
Bulletins et mémoires de la Société de radiologie médicale de Paris  
Bulletins et memoires de la Société médicale des hopitaux de Paris  
Bulletin mentale de Société de Belgique  
Bulletin officiel de la Société française d' electrotherapie, Paris  
Cajal's Trabajos  
Canadian Medical Association Journal  
China Medical Journal  
Correspondenz-Blatt fur schweizer Aerzte  
Deutsche medizinische Wochenschrift  
Deutsche Zeitschrift fur Nervenheilkunde  
Dublin Journal of Medical Science  
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Edinburgh Medical Journal  
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Folia neuro-biologica  
Fortschritte aus dem Gebiete der Rontgenstrahlen  
Gazetta degli ospedali e delle cliniche  
Glasgow Medical Journal  
Heart  
Hospitalstidende  
Hygiea  
Illinois Medical Journal  
Imago  
Indian Journal of Medical Research  
Indian Medical Gazette  
International Clinics  
Internationale Zeitschrift fur arztliche Psychoanalyse  
Jahrbuch der Radioaktivitat und Elektronik  
Jahrbuch fur Neurologie  
Jahrbuch fur Psychoanalyse  
Journal international de radiologie et d' electricité, Bruxelles  
Journal de médecine de Bordeaux  
Journal de neurologie  
Journal de radiologie et d' électrologie  
Journal fur Neurologie und Psychiatrie  
Journal of Abnormal Psychology  
Journal of the American Medical Association  
Journal of Bacteriology  
Journal of Biological Chemistry  
Journal of Cancer Research  
Journal of Comparative Neurology  
Journal of Criminology and Criminal Law

- Journal of Experimental Medicine  
 Journal of General Physiology  
 Journal of Hygiene  
 Journal of Immunology  
 Journal of Industrial Hygiene  
 Journal of Infectious Diseases  
 Journal of Laboratory and Clinical Medicine  
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 Journal of Mental Science  
 Journal of Nervous and Mental Diseases  
 Journal of Parasitology  
 Journal of Pathology and Bacteriology  
 Journal of Pharmacology and Experimental Therapeutics  
 Journal of Physiological Abstracts  
 Journal of Physiology  
 Journal of Psychology, Philosophy and Scientific Methods  
 Journal of Roentgenology  
 Journal of Sociologic Medicine  
 Journal of State Medicine  
 Journal of Tropical Medicine and Hygiene  
 Journal d' urologie  
 Journal of Urology  
 Kitasato Archives of Experimental Medicine  
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 Lyon médical  
 Medical Clinics of North America  
 Medical Journal of Australia  
 Medical Journal of South Africa  
 Medical Record  
 Medicine and Surgery  
 Mental Hygiene  
 Mitteilungen aus dem Laboratorium für radiologische Diagnostik und Therapie  
 im k. k. allgemeinen Krankenhaus in Wien  
 Mitteilungen aus der medizinischen Fakultät der kaiserlichen Universität zu  
 Tokyo  
 Modern Hospital (The)  
 Modern Medicine  
 Monatschrift für Neurologie und Psychiatrie  
 Münchener medizinische Wochenschrift  
 Nederlandsch Tijdschrift voor Geneeskunde  
 Nervous and Mental Disease Monographs  
 Neurological Bulletin  
 Neurologisches Zentralblatt  
 New York Medical Journal  
 Norsk Magazin for Lægevidenskaben  
 Northwest Medicine  
 Note e rivista di psichiatria  
 Nourrisson (Le). Revue hygiène et de la pathologie de la première enfance



Obersteiner's Arbeiten  
Parasitology  
Paris médical  
Pediatrics  
Pfluger's Archiv  
Philippine Journal of Science  
Philosophical Review  
Pisani (II)  
Policlinico, Roma  
Practitioner, The  
Presse médicale  
Progres médical  
Psychiatrische en Neurologische Bladen  
Psychoanalytic Review  
Psychological Bulletin  
Psychological Review  
Public Health Journal  
Public Health Reports  
Quarterly Journal of Medicine (London)  
Quarterly Medical Clinics  
Radiologia (La) medica, rivista mensile. Organo ufficiale della Gennavio,  
Pavia e Milano  
Radiologîe. Supplement et Bulletin médicale  
Radium. La radio-activité et les radiations  
Rassegna di studi psichiatria  
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Revista de la Asociacion médica argentina  
Revista de patologia nervose e mentale  
Revista de psiquiatria (Lima, Peru)  
Revista espanola de electrologia y radiologia médicas  
Revista espanola de frenatria  
Revue de médecine  
Revue médical de la Suisse Romande  
Revue neurologique  
Riforma médica  
Rivista italiana di neuropatologia, psichiatria e elettroterapia  
Rivista quindicinale di psicologia, psichiatria, neuropatologia  
Rivista sperimentali di freniatria  
Roentgen Supplement appearing with Interstate Medical Journal; Journal of  
Surgery, Gynecology and Obstetrics; American Journal of Medical Sci-  
ences; American Journal of Children's Diseases.  
Schweizer Archiv fur Neurologie und Psychiatrie  
Schweizer Archiv fur Neurologie  
Sei-i-Kwai Medical Journal  
Sémana médica  
Siglo (El) médico  
Social Hygiene  
Sociologie Medicine  
Sommer's Arbeiten  
Southern Medical Journal

Strahlentherapie

Svenska Lakare-Sällskap

Transactions of the Section on Diseases of Children A.M.A. 1919.

Transactions of the Section on Nervous and Mental Diseases A.M.A. 1919

Transactions of the Section on Pathology and Physiology A.M.A. 1919

Transactions of the Section on Pharmacology and Therapeutics A.M.A. 1919

Transactions of the Section on Practice of Medicine A.M.A. 1919

Transactions of the Section on Preventive Medicine and Public Health A.M.A.  
1919

United States Naval Medical Bulletin

Ugeskrift for Læger

Upsala Lakareforenings Förhandlingar

Von Monakow's Arbeiten

Zeitschrift für die allgemeine Neurologie und Psychiatrie

Zeitschrift für physiologische Chemie

Zentralblatt für Bakteriologie. Originale und Referate



# INTERNATIONAL MEDICAL DIGEST

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## SECTION ON GENERAL MEDICINE

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### FOREWORD

By LUTHER F. WARREN, M. D.

The World War has wrought many changes in medicine and in medical minds. More than ever before the value of the exchange of thoughts has been emphasized. Those of the profession who went abroad learned much from the French, English and Italian physicians with whom they were brought in daily contact. Those who remained at home, whether in camp or on draft boards, felt the benefit which accrued from such medical intercourse. They learned to look at medical problems from many sides and to respect more thoroughly the opinions and view-points of others. All were determined not to lose, to the future good of medicine, the inspirations thus derived. It seems timely, therefore, that the birth of this new ideal in the practitioners' ranks should be fostered.

The physician has now returned to his post of duty and again finds himself attacking his daily problems individually. Few can avail themselves of the occasional lecture or of the meetings arranged to discuss special problems, and lack of time prevents most of them from investigating the voluminous literature which is constantly appearing. It is therefore an opportune time for a publication to undertake to meet this need and to encourage the new ideal in a new way.

Such is the purpose of the INTERNATIONAL MEDICAL DIGEST. It aims to give to the practitioner in terse and forceful form the work carried out each month throughout the world in the fields of internal medicine, pediatrics, neurology, gastro-enterology, immunology, endocrinology, experimental medicine, and therapeutics. In all, over two hundred medical journals bearing on the above subjects have been selected and assigned to specialists in their various departments; these men will make digests of the articles and not only present the facts but transmit accurately the spirit in which they were written.

The INTERNATIONAL MEDICAL DIGEST will appear monthly, and hence the practitioner will be able to keep in touch with new ideas, recent advances in medicine, and with that branch which so often puzzles him—new methods of treatment. It will be indexed so that he can turn, without delay, directly to the subject which interests him. At the end of each year a complete index will be furnished. This will give the results, in brief form, of the work which has been done during that period in the fields already noted. A knowledge of what others are doing with problems similar to his own will give the physician greater confidence in carrying out and bettering the type of work which he is himself attempting. Above all it will advance the ideal of the community of thought, the necessity for which has recently been realized by many physicians.



## Abstracts

LEAKE, J. P.: The Transmission of Influenza. *Boston Medical and Surgical Journal*, Dec. 11, 1919, clxxxi, No. 24, p. 675.

The author deals with the continuation of studies on the same subject made in Boston and San Francisco during 1918. San Francisco experiments proved negative as to the transmission of human influenza. In Boston experiments with the Pfeiffer bacillus, with secretions, with direct exposure, with subcutaneous inoculations of filtered secretions and unfiltered blood, were entirely negative. These two sets of investigators coöperated with the author and others, and obtained another set of volunteers with whom to carry on the study. There were 44 volunteers, of whom 19 gave no history of exposure to influenza; 2 had had influenza, 11 had had close contact with the disease, and 12 had had casual contact. Temperature curves, blood-counts, Schick test, the presence of bacterial flora in the nasopharynx, before and after each experiment, were recorded for each volunteer. Each group of volunteers was isolated from the others while undergoing experimentation. The first experiment was made with Pfeiffer's bacillus of known virulence. One-tenth c.c. of the culture, containing five billion bacilli per c.c. was fatal to white mice of 20 gram weight in forty-eight hours. This was combined with a staphylococcus culture and instilled into the nose and throat of 10 volunteers, 3 of whom had been alkalinized with a 4 per cent solution of sodium bicarbonate before the experiment. Three others had received  $\frac{1}{2}$  per cent acetic acid, and the remaining 4 had had nothing done to their noses and throats. There was no result from this experiment, except a transient tonsillitis in the case of 1 recipient. Next, the unfiltered nasal and pharyngeal secretions of a patient, twenty-two hours after the onset of what appeared to be a mild attack of typical influenza, were instilled into the nose and throat of 10 volunteers. One developed a mild tonsilitis and 1, five days later, symptoms resembling those of influenza. Two days after the onset an attempt

was made to transfer the disease from this man to 10 other volunteers by the same method of inoculation, but without result. This case is a possible instance of artificial transmission of influenza by nasopharyngeal inoculation of secretions from an early case of the disease.

An outbreak of 215 cases in the Portsmouth Naval Prison furnished donors for other experiments. Two groups of 4 volunteers were taken from there. One group received nasopharyngeal washings from very early cases of the disease five hours after onset. Each had 10 c.c. of the washings instilled into the nose and throat by spray and dropper and swallowed 25 c.c. of the washings mixed with 250 c.c. of milk. Two developed acute tonsillitis. The other group received washings from 10 persons who had been in recent contact with influenza. The experiment was without result. Another set of 10 volunteers received the secretion from an uncomplicated case of influenza four hours after onset. One developed influenza; the others remained well. Fifty-four hours after onset the attempt was made to transfer the disease from this man to 15 others, but without result.

M. M. BANOWITZ.

GREELEY, HORACE: Vaccine As a Prophylactic Against Influenza, and Local Reaction as a Guide to Immunity. *Medical Record*, Oct. 11, 1919, xevi, No. 15, p. 624.

Greeley made a vaccine from 17 "strains" or cultures of the influenza bacillus (Pfeiffer's) from as many different cases of the epidemic of 1918. The vaccine was grown on blood-agar, washed off in saline, heated for one hour at 60° C., standardized at 2,000 million bacilli in each cubic centimeter, and preserved with 0.5 per cent phenol. As a first dose the author administered 1 c.c.; as a second 1½ c.c. and as a third 1 c.c., with an interval of from two to three days between each two injections.

As a result of his observations with this vaccine he arrives at the following general conclusions:

- (1) The effect of the administration of vaccine made of the influenza bacillus upon those who had previously presumably suffered from the epidemic of 1918, and upon those who had, at the



time of his report, escaped it, are exactly those to be expected under the principles of infection and immunity.

(2) By observance of the local effects of a dose of vaccine one may determine whether the individual possesses any immunity against influenza, and, if so, its approximate degree.

(3) A large group of non-immune children, exposed to the infection in an institution where the epidemic had just started, were protected from an attack, and no further cases of the disease occurred in the institution.

(4) As a direct consequence of the above, and, indirectly, through the knowledge of the protective properties of vaccines, which give rise to similar phenomena when administered in the prevention of disease, it may be concluded that a vaccine of a mixture of different strains of the influenza bacillus has a definite protective value in preventing influenza in those not already immune to the disease.

M. KESCHNER.

ELY, T. C.: Alkali Treatment Applied to the Acidosis of Epidemic Influenza. *New York Medical Journal*, April 5, 1919, cix, No. 14, pp. 573-576.

Acidosis is a constant factor in all infectious fevers. It was found to be especially prominent in the recent influenza epidemic, and was probably responsible, in large measure, for the high fatality of the disease.

Clinical proof of the presence of acidosis was furnished by the peculiar acetone odor of the breath, the dyspnea and air hunger, and the associated cyanosis, due to withdrawal of the alkali reserve. The therapeutic proof was also convincing. Proper doses of the three basic alkalis (sodium, potassium and calcium) caused a gradual cessation of the acidosis symptoms.

Other writers corroborate the author's conviction that treatment with alkali bases is the most effective therapeutic procedure. It is known that if the alkalis necessary in the body to neutralize the poison acids are withdrawn or used up, the tissues are destroyed, and life cannot be preserved unless the alkali bases are supplied. "In such a high state of toxemia as epidemic influenza, due to a combination of the most toxic bacteria known, with probably an unknown

organism, there is necessarily a high degree of acidosis, and the body bases are soon used up, as the aromatic breath alone indicates."

The author quotes A. Taylor as saying: "As the acids circulate in the system they abstract from the tissues sodium, potassium, and calcium, and disturb the equilibrium of the basic elements in the tissues. Obviously the correct therapeutic measure is not to administer an alkali of one type . . . but a mixture of sodium, potassium and calcium . . . in order to restore the equilibrium."

A free water supply is essential to the osmotic process of combination between the alkali bases of different weights and the poison acids. It is also necessary for the purpose of elimination of the products of this combination, and to prevent alkalosis. The dosage of the alkalis must be carefully calculated, in order to avoid injury to the tissues.

*Treatment.*—Elimination of the toxic substances is instituted by profuse perspiring, and by divided doses of calomel, 1/10 grain (0.006 gram) every half hour, until a grain or more has been given. Water is given freely. Perspiration is induced by drinking large quantities of hot boneset tea, or by hot mustard foot baths and hot water bottles. Sodium bicarbonate, 1 1/2 ounce, with peppermint water, 4 ounces, teaspoonful every two hours, may be alternated with potassium citrate, 1 1/2 ounce, with peppermint water, 4 ounces, teaspoonful every two hours. The calcium salts may be given as lime water, 1/3, milk, 2/3. The author also administers 1 teaspoonful of sodium bicarbonate to a pint of luke-warm water, every four hours, by enema.

In the case of patients who cannot tolerate the potassium salts, the author gives "the sodium bicarbonate mixture every hour and the soda enema as above with a course of calomel 1/10 grain (0.006 gram) with no excipient and codein in small doses."

The cardiac and respiratory stimulants (strychnin, caffein, spartein, digitalis, camphorated oil, oxygen and aromatic spirits of ammonia) may be given in addition.

The flushing of the system through the skin is especially important in view of the increased output of carbon dioxid, which must be eliminated by perspiration. Large amounts of toxin and waste products may also be removed in this manner, and through the kidneys, and the administration of quantities of water is therefore advisable.

Opium, morphin or codein, given to relieve the pain in the colic

of intestinal influenza, suppress the excretions and delay the elimination of poisonous substances and, consequently, recovery.

The alkali treatment is not only beneficial, but also without danger to the individual, which is not always true of other remedies. Aspirin relieves pain but depresses the heart. Opium checks secretions, as do also atropin and belladonna, even though they stimulate the heart and respiration.

Serum treatment cannot be considered effective until the specific organism causing influenza has been definitely isolated. Reïnfections occur, proving that attacks of the disease do not produce active immunity. There is, therefore, little hope of obtaining passive immunity by serum treatment.

In conclusion the author repeats that the chief cause of death in epidemic influenza is the acidosis. Even the pneumonia would probably not develop if the body bases were not exhausted. This may apply also to nephritis and to cardiac involvement. The aim of the alkali treatment, therefore, is to overcome the acidosis and allow the patient's vital resistance to combat the invading organism.

REDDEN, W. R.: Treatment of Influenza-pneumonia by the Use of Convalescent Human Serum. *Boston Medical and Surgical Journal*, Dec. 11, 1919, clxxxi, No. 24, p. 688.

A report is given of 100 cases treated in private practice. The group includes all cases showing positive signs of lung involvement. The amount of serum given at each injection was 120 c.c.

*Persistence of fever after first injection:*

Normal in 24 hours or less.....	42
Normal in 58 hours or less.....	33
Normal in 72 hours or less.....	8
Normal in 4 days or more.....	1

Three-quarters of the cases were normal in forty-eight hours, showing a decided shortening of the course of the disease.



*Number of injections received by each patient:*

1	received by	52	patients
2	"	"	35
3	"	"	8
4	"	"	3
5	"	"	2

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100

There were 13 women in this group at least five months advanced in pregnancy; 3 died (23 per cent), showing a great reduction in mortality compared with the figures given by others, which vary from 50 to 55 per cent. The death totaled 16, but excluding the cases where the serum was given too late, and where the patient died of complications other than pneumonia, there remain only 3 deaths. A just estimate of the efficacy of the serum lies between 3 per cent and 16 per cent. The conclusion is that the course of the disease is shortened, the death rate cut one-half in severe cases, and about three-quarters in cases treated early. The best serum is the pooled serum from convalescent patients.

M. M. BANOWITCH.

HUNTOON, F. M., AND HANNUM, S.: The Rôle of *Bacillus influenzae* in Clinical Influenza. *Journal of Immunology*, July, 1919, iv, No. 4, p. 167.

*Bacillus influenzae* is capable of producing a toxic substance. When introduced into the circulation it produces congestion of the respiratory tract with hemorrhages into the alveoli. Certain conditions of symbiotic growth intensify the liberation of the toxin, and as an effect of the action of the poison, the lungs show predisposition to invasion by various organisms, with the production of secondary lesions. Live bacilli introduced at a remote point probably affect the lungs through the action of a liberated toxin. There is nothing in the serological evidence to preclude the consideration of this organism as an important factor in the causation of clinical influenza.

W. LINTZ.

CROWE, S. J., AND THACKER-NEVILLE, W. S.: The Influenza Bacillus in Paranasal Sinus Infections. *Bulletin of the Johns Hopkins Hospital*, Nov., 1919, xxx, No. 345, p. 322.

In order to determine whether the *Bacillus influenzae* occurred more frequently in maxillary sinus infections associated with the recent influenza epidemic than with similar infections before the onset of the epidemic, the authors have compared their bacteriological findings in two series of cases. The first series included 70 cases occurring in the years 1912-1918. In this series the *Bacillus influenzae* was found in the antrum in 15 cases (21 per cent). The second series comprised 30 cases studied during February, March and April, 1919. The influenza bacillus was found in the antrium in 8 cases (26 per cent). In 4 it was found in pure culture. The streptococcus was the most common offender in both series. The authors group the *Bacillus influenzae* with the streptococcus and pneumococcus as secondary invaders, and not as the primary causes of the disease known as influenza.

T. HOWARD

HART, T. S.: The Heart in Bronchopneumonia: Observations on the Activity of the Heart and its Response to Digitalis Made During the Recent Epidemic. *American Journal of Medical Sciences*, Nov. 1, 1919, clviii, No. 5, p. 649.

The author's observations were made in New York City. The cardiac activity was similar to that in uncomplicated typhoid fever. The cyanosis must be explained on grounds other than insufficiency of the right heart, as postmortem examination revealed no evidence of dilatation on either side. The fatal termination presented a picture of overwhelming toxemia, and those patients with chronic valvular disease withstood the toxemia of the pneumonia very badly. The normal heart, in individuals who developed pneumonia, did not show evidence of damage. A study of the action and value of digitalis was determined. Two preparations were used, the tincture given by mouth, and "digifolin" (solution of digitoxin and digitalin), given intravenously. Both preparations were thoroughly tested and standardized. As soon as a reasonably certain

diagnosis was made the routine method adopted was to begin with 25 minims of the tincture every four hours for 6 doses, and then to reduce the amount to 15 minims every eight hours. Modifications were made in accordance with the patient's manifestations during the course of the disease. If symptoms of toxemia developed very rapidly, or if patients were admitted in this condition, they received from 15 to 30 minims every four hours up to 3 or 4 doses of digifolin, intravenously. Then the tincture was usually substituted. Controls were made, from time to time, for comparison on cases selected at random, and in which no digitalis preparation was given, other therapeutic methods being identical in all respects. No difference in the course of the disease could be observed in the two series except by electrocardiogram. This method showed characteristic changes in those patients receiving digitalis; in two instances arrhythmia developed, which proved to be due to a condition of partial heart-block. No change in pulse-rate or in blood-pressure could be attributed to the drug. Some rates were below 100; others were more rapid, but failed to diminish on increase of the drug. The terminal increase of heart-rate in fatal cases was identical in both series of cases. Two former patients with chronic cardiovascular disease with auricular fibrillation, who previously responded satisfactorily to digitalis, fell ill with influenza, and both developed the typical picture of pneumonias seen in the other cases. Both were given digitalis, and the circulatory condition improved. The heart slowed to half the rate, and appeared to be reasonably efficient. The patients died, one on the sixth, the other on the tenth day. In neither case was the heart-failure the apparent cause of death. In 4 instances, out of several hundred to whom digitalis was administered, heart-block was shown. All recovered and gave no evidence of subsequent ill effects following the use of the drug. In 1 case 465 minims (27.9 c.c.) of the tincture were given before partial heart-block appeared; in another an almost identical heart activity appeared after 230 minims (13.8 c.c.). Other patients received larger amounts but did not show evidence of heart-block.

Digitalis should be given in moderate amounts, and one should approach complete digitalization gradually.

A. T. MAYS.



GOODPASTURE, ERNEST W.: The Significance of Certain Pulmonary Lesions in Relation to the Etiology of Influenza. *American Journal of Medical Sciences*, Dec., 1919, clviii, No. 6, p. 863.

In studying the pathologic anatomy of this disease the author is convinced that an unknown virus produces characteristic lesions in the lungs and general intoxication with or without the coincidence of other infective agents. Many have studied this disease from a bacteriological standpoint, but they do not agree on the etiology. The pulmonary lesion which Goodpasture describes as having already been seen by McCallum, Wolbach, and Barnett, is a hyaline membrane found on the dilated alveolar ducts. It partially or completely covers the walls, and occasionally those of the subtended alveoli. The membrane is not uniformly distributed throughout the lung, and is not present within all the dilated air spaces. It is irregular in thickness, sometimes stratified, with occasional cells within narrow clefts. At its margins it may be continuous, with strands of fibrin, though it does not give the staining reactions for fibrin. It may completely fill an alveolus and is generally thickest over the angles of the wall. It is usually composed of fused necrotic mononuclear cells, or of strands of fibrin, or a mixture of both. A varied degree of hemorrhage, edema, cellular and fluid exudate, and focal necrosis of the alveolar walls may accompany this membranous formation. It contains nothing specific in its elements of comparison, but is constantly present in pulmonary inflammation, associated with influenza, and is most conspicuously seen in acute pneumonia of short duration; it is absent in other types. The membrane is not an end result typical of any demonstrated microorganism, and is usually found by ordinary methods to be bacteria-free.

A. T. MAYS.

FISHBURG, M.: Influenza and Tuberculosis. *American Review of Tuberculosis*, Nov., 1919, iii, No. 9, p. 532.

After citing the agreement among the authorities of medicine that influenza is a powerful activator of latent tuberculosis, the author attempts to show that such is not the case. That there is no basis for this apprehension was evident to him after the pandemic

of 1918-19. In fact, it appeared that the prognosis of influenza was much better in those who suffered from tuberculosis, or any other chronic pulmonary disease, notably asthma, bronchitis, emphysema, bronchiectasis, etc., than in those in whom the lungs and bronchi had been apparently in healthy condition. Moreover, it was observed that far from aggravating the condition of tuberculous patients, influenza runs a milder course than when it attacks healthy persons.

Influenza, of the type which has prevailed in Europe and America during the past two years, attacks primarily the upper respiratory tract, while the bronchi and lungs are attacked in a relatively small portion of the cases. The majority of cases suffer from acute coryza, tonsillitis, pharyngitis, tracheitis, etc. These inflammatory processes are practically never seen in incipient tuberculosis. When, however, the lesion in influenza descends to the deeper respiratory passages, producing bronchitis, pneumonia, pleurisy, etc., confusion with acute phthisis may occur, when it is not taken into account that these symptoms were preceded and in fact accompanied by signs of acute inflammation of the throat. During convalescence the persistent cough, debility and malaise, etc., and physical signs of atelectasis and catarrh of the air vesicles and smaller bronchi, seem to justify the diagnosis of pulmonary tuberculosis. It is a known fact that with these symptoms and physical signs, the persistent examination of the sputum fails to reveal the tubercle bacilli. In the differential diagnosis between postinfluenzal pulmonary lesion and tuberculosis, the author contends that in phthisis the alterations in the resonance and breath sounds are almost invariably found over the upper lobe of either or both lungs, while in influenzal bronchitis, post-pneumonic fibrosis, or localized catarrh, the lesion is, in the vast majority of cases, found in the lower lobes. Phthisis with such vast lesions developed in such a short time manifests itself by severe constitutional symptoms, such as tachycardia, fever, emaciation, etc. In postinfluenzal lung lesions the pulse is usually slow, and fever is absent, except in pleural effusion or pulmonary abscess, etc. In the rare cases where the postinfluenzal lesion is found in the upper lobe, this point is of immense diagnostic import. The resonance above the clavicle remains unimpaired, and Kronig's areas show no contraction, while in phthisis these are almost invariably defective. In studying the

effects of influenza on the tuberculous, it was found that tuberculosis cases were no more liable than others, and that in the severe cases the death rate was no higher than that among the non-tuberculous. It was interesting to note that in cases with artificial pneumothorax the patient recovered. The course of influenza among the tuberculous was milder, and after the attack subsided the chest condition was found to be neither improved nor aggravated.

The author cites Amberson and Peters at the Loomis Sanatorium, who state that the tubercle bacilli did not appear after the attack, in cases where they were previously absent. At the Chicago Municipal Sanatorium only 85 out of 1,551 hospital tuberculous patients were infected with influenza, constituting only 5.4 per cent.

Franklin C. Gram in Buffalo, N. Y., reported that of 33,880 cases of influenza reported in that city, 25,699 were visited and investigated after the epidemic had abated. Only 27 were found to be suffering from tuberculosis. Out of this number 11 were already on their records as reported cases of tuberculosis before the influenza epidemic began, and must therefore be eliminated from the number which could possibly be charged to influenza. In 8 cases the diagnosis of tuberculosis had not been definitely established (the patients were merely suspects). This leaves 8 cases reported as having followed influenza.

The author concludes that influenza has no etiological relation to tuberculosis and is not to be considered a reactivator of dormant lesions. Influenza patients are no more liable to contract the disease than are normal persons, and, when contracted, the disease does not run a more acute or more severe course than in other cases. The tuberculous lesions have not been observed to assume an acute and progressive course after an attack of influenza. The pulmonary sequelæ remaining after influenza are almost without exception non-tuberculous in character, and do not require the treatment accorded phthisical patients.

C. A. SCHMID.



HERRICK, W. W., AND DANNENBERG, A. M.: Recurring Meningococcic Meningitis. *The Medical Clinics of North America*, Sept., 1919, iii, No. 2, p. 379.

Seven cases of recurring meningococcic meningitis are reported, 6 of which represent 2.2 per cent of camp epidemic, recurring from four to sixteen weeks after recovery from the first attack. The original attacks with one exception were of a severe type and all received abundant serum therapy.

The result of necropsy findings in prolonged and convalescent cases of meningococcic meningitis shows that the exudate in the subarachnoid space is absorbed slowly. At the base of the brain, at the lumbar part of the cord and cauda equina, and less frequently at the choroid plexus and the other parts of the ventricles, a jelly-like substance mixed with varying amounts of fibrinopurulent exudate may be found weeks after active symptoms have subsided. From such remaining foci, infection probably recurs. Other locations where the meningococcus may be walled off and cause reinfection are the accessory nasal sinuses, joints, precordium, eye and middle ear. The importance of the proper attention to such local conditions is very evident. Reinfection from without with a different type of meningococcus seems less likely to occur.

In persons treated with the serum, the immunity is largely passive, and therefore no great demand has been made on the body for the production of antibodies. The immunity is largely temporary and gradually passes off, leaving the body subject to reinfection from the foci mentioned. In order to overcome this deficiency the authors recommend the giving of a meningococcic vaccine, preferably autogenous, during convalescence. Dosages of 50 to 200 millions, given at five-day intervals, for three or four injections, are advised.

H. WOLFER.

HADEN, R. L.: Meningococcus Meningitis at Camp Lee. *Archives of Internal Medicine*, Nov. 15, 1919, xxiv, No. 5, p. 514.

From a study of the cases of meningitis occurring at Camp Lee, Haden concludes that meningococcus meningitis, in probably every case, is primarily a generalized infection with subsequent meningeal localization. The use of immune serum intravenously marks a

great advance in the treatment of the disease. Prolonged intraspinal treatment is very apt to result in permanent ill effects from the involvement of the cauda equina and nerve-roots. Intravenous treatment decreases the number of intraspinal treatments necessary, thus minimizing the harmful effects of local treatment. One case is reported in which an active localized infection in the meninges recovered under intravenous therapy alone.

T. HOWARD.

HOLM, M. L., AND DAVISON, W. C.: Meningococcus Pneumonia.

I. The Occurrence of Postinfluenzal Pneumonia in Which the Diplococcus Intracellularis Meningitidis was Isolated. From Observations at Camp Coetquidon, A. E. F., France. *Bulletin of the Johns Hopkins Hospital*, Nov., 1919, xxx, No. 345, p. 324.

At Camp Coetquidon, during the influenza epidemic, 85 patients suffering from postinfluenzal pneumonia were found to have meningococci in the sputum; 23 pneumonia patients coming to autopsy showed meningococci in the lungs. In severe cases the onset was usually acute, after a period of indisposition lasting a few days or a week. During the prodromal period there was usually a history of chills, fever, headache, cough, pain in the chest and general malaise. The patient's appearance showed a high degree of poisoning; the chest examination showed variable areas of dullness and numerous moist râles, quite generally distributed. The temperature was 103-106° F. (39.44 - 41.11° C.), pulse from 85 to 100, respiration 25 to 30. A blood culture was sterile, and the leukocytes were normal or reduced in number. The sputum was at first thin and watery, but rapidly changed to a creamy white, which, on microscopical examination, showed numerous pus-cells and Gram-negative diplococci. Severe cases grew rapidly worse; the cyanosis increased; the lung consolidation extended and the patient died within a few days. Among those who survived, there seemed to be a marked tendency toward the development of a suppurative bronchiolitis and protracted recovery.

During the same period, 22 cases of meningococcus meningitis occurred, and four surveys, of from 1,160 to 2,286 men each, showed

a percentage of carriers varying from 5 to 16 per cent. The strain of meningococcus proved to be Type B Pasteur in all of the meningitis cases which were classified, and in the majority of the pneumonia cases. It was usually found in combination with other organisms in pneumonic lungs, but was recovered in pure culture in 7 cases. Both bronchopneumonia and lobar pneumonia were encountered, but the former was the more frequent.

The authors conclude that cases of meningococcus pneumonia may arise from contact with cases of meningococcus meningitis, and *vice versa*.

T. HOWARD.

DAVISON, W. C., HOLM, M. L., AND EMMONS, V. B.: Meningococcus Pneumonia. II. The Epidemiology of Postinfluenzal Pneumonia in Which the Diplococcus Intracellularis Meningitidis was Isolated. From Observations at Camp Coetquidon, A. E. F., France. *Bulletin of the Johns Hopkins Hospital*, Nov., 1919, xxx, No. 345, p. 329:

The investigators found that three brigades at Camp Coetquidon came from Camp Beauregard (Louisiana) in which numerous cases of cerebrospinal meningitis had occurred the previous winter. Probably many of these men still harbored organisms in their throats. The epidemic of influenza greatly increased the number of carriers because of the opportunities for infection through coughing. A study of the carrier rates of hospital patients and barrack contacts showed such a wide distribution that it was impossible to determine whether the infections occurred after the patients were received in the hospital or before. It was concluded that the meningococcus was both endemically and epidemically distributed in the rhinopharynges of the troops in Camp Coetquidon, and that this explained the relatively large number of cases of postinfluenzal pneumonia in which meningococci were isolated. The technic of the examination of contacts is described in detail.

T. HOWARD.



THAYER, W. S.: The Medical Aspects of Reconstruction. *The American Journal of Medical Sciences*, December, 1919, clviii, No. 6, p. 765.

In private practice physicians are apt to discharge patients before convalescence is complete. In the army there was a chance to study convalescence throughout the entire period of reconstruction. A systematic study of the following conditions was made by the neuro-psychiatrists and gas experts:

- (1) Neuroses and psychoneuroses.
- (2) Mildly gassed cases.
- (3) Psychoneuroses of a severe character.
- (4) Convalescents from operations, various types of non-disabling wounds, gas intoxications, and disease.
- (5) Effort syndrome group.
- (6) Tuberculous group.

The problem cases of the field hospital were due to exhaustion, fear, mild gassing, and psychoneurosis. After the establishment of the system, 80 per cent of those sent to the field hospital were returned to the line. The base hospitals received the more serious cases. The neurological center at Lafauche (Base 117) returned 93 per cent to duty, 20 per cent to field duty and 7 per cent to the United States. At the orthopedic retaining center, Lt. Aignan accomplished excellent rehabilitation, especially by correcting bad shoeing. Following the English system, convalescent camps were planned near each base to receive the overflow of convalescents, and here they were given carefully devised physical and mental training in the form of graded exercises, setting-up exercises, drills, and marches, interlarded with rest and amusement under the direction of medical officers who had had training in cardiovascular work. Good results were obtained with the ordinary cases of effort syndrome. Suspected cases of tuberculosis were sent to special centers where proper study and special rehabilitation were given. The follow-up system at Convalescent Camp No. 2 gathered interesting data at two- and six-month intervals. Outside of the killed and wounded, 99 per cent of those returned to duty as Class A men were performing normal functions. These convalescent camps gave exceptional opportunities for studying systematically the ordinary medical and surgical conditions. Figures

show that the average time of stay in hospitals and camps for tuberculosis was thirty-one days, for pneumonia fifty-eight days, for acute tonsillitis thirty-one days, for acute bronchitis thirty-six days, for herniotomy fifty days, for mumps thirty-nine days.

Convalescent departments would be of immense advantage for large industrial institutions, directly connected with the large hospitals under their supervision, and not convalescent homes. The work carried on at General Hospital No. 9 proved the value of physical and mental training of large bodies of slightly subnormal individuals, especially those of the functional cardiovascular group.

A. T. MAYS.

CONNOR, L. A.: Cardiac Diagnosis in the Light of Experiences With Army Physical Examinations. *American Journal of Medical Sciences*, Dec., 1919, clviii, No. 6, p. 773.

The author summarizes 4,000,000 cases studied by special examination in cardiovascular work. The extent and frequency of the normal variations from the conventional physical signs are recognized. Every type of cardiac sign—the position of the apex beat, cardiac impulse, area of dullness, character and intensity of sounds—varied in normal individuals. They were influenced by the size and shape of the chest wall, by rest, exercise, etc. Essential knowledge of functional disorders and organic diseases was gained. Nine-tenths of apical systolic murmurs in the young adult are functional, having special features: They are inconstant; are absent during rest; they disappear on change of posture; they are not transmitted to the left of the apex; they are never high pitched; they have a wheezing or blowing quality. Diastolic functional cardiorespiratory murmurs at the base are present and may be mistaken for aortic insufficiency.

Effort syndrome was the commonest heart disorder. Its symptoms were misleading and likely to be mistaken for organic disease. The constitutional type possessed symptoms existing before the war. Healthy soldiers developed neurocirculatory asthenia after pneumonia, rheumatic fever, and influenza. This syndrome is obviously present during peace time and should be recognized. Pronounced subjective symptoms and suggestive physical signs are associated with soldiers' heart and must not be mistaken for organic disease. On

slight exercise the syndrome cases usually show an array of symptoms: breathlessness, exhaustion, precordial pain, tachycardia, etc., and give poor response to effort, while the soldiers with valvular lesions are free from symptoms and give a good response to exercise.

The diagnosis of mitral insufficiency is justified in the presence of a history of definite rheumatic fever, hypertrophy, and an apical systolic murmur. In the absence of cardiac hypertrophy, or of a history of definite rheumatic fever, even though the murmur is present and transmitted, it is doubtful whether one is justified in characterizing the condition as a mitral leakage. To justify a diagnosis of mitral stenosis a distinct and evident characteristic presystolic murmur must be present. Care should be taken not to mistake cases of effort syndrome for this form of valvular disease.

Synthetic cardiovascular diseases were very rare. Among 1,000,000 drafted men, 11,562 were rejected and only 20 had thoracic aneurysms.

Aortic insufficiency was rare but was apt to have been overlooked, as the murmur was faint and best heard with the unaided ear.

A. T. MAYS.

HOWARD, TASKER: Later Stages of So-called War Nephritis.  
*American Journal of Medical Sciences*, Dec., 1919, clviii,  
No. 6, p. 844.

Thirty-seven cases were received at Camp Lee from overseas, with a diagnosis of nephritis. In these cases the period of onset varied from two to seven months. Three patients had had previous attacks of nephritis. Thirty-five had had edema at onset persisting, in 2 cases, up to the time of admission. In 26 cases teeth and tonsil examinations were made. Tonsillar disease was present in 10 and root infection in 4 cases. Albuminuria was present in 31 cases, and persisted in 24. Cylindruria persisted in 16 cases. Sodium chlorid excretion was normal. Polyuria was not uncommon, but when it occurred it was a valuable sign. Relative increase of night urine was practically constant in active cases, and was not infrequently the only anomaly in an apparent recovery. Blood urea above 35 mg. per 100 c.c. usually indicated nephritis, but normal readings were found



in active cases. Moderate depression of phenolphthalein output was not an uncommon finding in those patients who had apparently recovered. An elevation of systolic blood-pressure was constant. In 7 active cases the diastolic pressure exceeded 100; in 11 active cases it was below 100. A moderate degree of anemia was common. No one factor was considered pathognomonic. Nineteen cases were discharged as recovered; 18 showed definite kidney pathology, and of the 18 one died of uremia. Nine showed a fair chance of recovery.

A. T. MAYS.

DAY, H. B.: War Nephritis: A Clinical Study of Early Cases. *The Archives of Diagnosis*, January, 1919, xi, No. 3, p. 198.

*Varieties*.—(1) Recurrent nephritis; (2) infective nephritis; (3) war nephritis.

The last form was most commonly seen in all grades of severity showing two main clinical types: (*a*) the common form characterized by breathlessness, edema, and urinary signs of acute nephritis; (*b*) a smaller group distinguished by hematuria involving the lower urinary tract, as well as the kidneys, but without edema, as a rule.

*Incidence and Distribution*.—The rate rises in cold weather. Front line troops are mainly attacked; the disease is uncommon among troops which are well housed. Civilians in the war zone have not suffered. Previous renal disease or a former attack are predisposing factors. Scarlet fever, mineral poisons, or chlorinated water are not regarded as important factors.

*Onset*.—Forty per cent had antecedent symptoms of weakness, headache, pain in the back and legs, slight fever existing one to five weeks prior to the onset. Sixty per cent were without antecedent symptoms.

*Symptoms*.—These are: increasing breathlessness and the appearance of edema, generally with cough, headache, and pain in the back and legs; the frequency of respiratory complications in winter is a striking feature. Other symptoms are edema in the face and legs, with pain in the back constant only in cases with hematuria.

*Renal Findings*.—The urine shows moderate oliguria with, rarely, suppression. The specific gravity corresponds generally with the amount passed; it is never higher than normal and often low. The albumin varies greatly up to 1 or 2 per cent. Gross blood is charac-

teristic of "lower tract" cases, and is quite common in others without signs of irritation. Red blood-corpuscles and leukocytes are always found early, and epithelial and granular casts predominate.

*General Symptoms.*—Fever usually precedes or accompanies the onset and is of short duration. The usual course is afebrile, with a slow pulse-rate. Pains in the back and limbs begin with the initial fever, and during the afebrile period they are chiefly located on the shins. Headache is an early sign, and if persistent is usually associated with a high blood-pressure or urea retention. Splenic tenderness is often elicited, and enlargement of the spleen existed in 70 per cent of the cases observed. The blood picture, except in prolonged cases or those with persistent hematuria, is unchanged. The blood-pressure generally shows a moderate elevation at the systolic reading while the edema lasts and the fever is absent.

*Course.*—Spontaneous diuresis, occurring at any time from a week to a month, is usually a sign of approaching recovery. Periodical relapses characterize the course, during which there is a tendency to febrile reaction, a quickened pulse and a fall in blood-pressure, preceded by symptoms of general aches and pains. The spleen becomes larger and more tender; the output of urine falls in amount; albuminuria increases; sometimes there is a return of hematuria. Trench fever exhibits a similar periodicity. Signs of periodicity during the course of the disease are closely related to the accompanying changes in the size of the spleen.

L. B. ECKERSON.

STUART, SIR T. A.: Artificial Limbs Never so Perfect as Now.

Section on Occupational Therapy, etc., *The Modern Hospital*, Jan., 1920, xiv, No. 1, p. 75.

The war casualties have aroused a wide-spread interest in artificial limbs which, according to Sir Thomas Anderson Stuart of the University of Sydney, have never been so perfect as they are now. Although artificial limbs have been in use since 300 B. C., the advance in perfection has been made chiefly during the last fifty years. As a result many a hopeless, useless cripple is converted into a cheerful, self-reliant and self-supporting member of the community.

B. v. H. ANTHONY.

McMURTRIE, D. C.: Influence of Pension or Compensation Administration on Rehabilitation of Disabled Soldiers. *American Medicine*, June, 1919, p. 361.

In Canada pensions are divided into 20 classes and awarded in direct proportion to the degree of disability, due to pulmonary tuberculosis, graded from 5 to 100 per cent:

Class	Condition	Clinical Description	Employability	Percent- age of Disability
No. 1	Not Improved			100
No. 2	Improved	When there has been improvement sufficient to allow use of the term.	These cases will in all likelihood relapse on any but the lightest kind of work. During the first 6 months at least the disability should be considered as total.	100
No. 3	Quiescent	No constitutional symptoms. Tubercle bacilli may be present or not. Stationary or better physical signs, all foregoing having been present at least 2 months.	Practically an active case under ordinary conditions of life and should rest 75 per cent of time in order to carry on in fair health—hence minimum of 80 per cent for first 6 months.	80-100
No. 4	Apparently Arrested	Signs of healed lesion without any symptoms for 3 months.	Should rest one-half of the time.	50-80
No. 5	Arrested	Signs of healed lesion without relapse at end of 6 months under ordinary living conditions.	Should rest one-quarter of the time.	25-50
No. 6	Apparently Cured	Signs of healed lesion without relapse at end of 2 months under ordinary living conditions.	Only limitation of employability is that patient should avoid undue exposure to dust and debilitating conditions.	25-50

Pensions are subject to a periodical review. If the medical advisors of the Board of Pension Commissioners find that the ex-patient's condition has improved, or grown worse, they reduce or raise the estimate of his disability percentage and he receives a corresponding decrease or increase of pension.



NOLF, P.: Staphylococcic Bacteriuria. *New York Medical Journal*, Dec. 20, 1919, No. 25, p. 1,009.

During trench warfare staphylococcic blood infections were frequently met with among the soldiers; these were usually due to badly treated furunculosis, scabies, or pediculosis. In addition to the patients with true staphylococcic septicemia with a great many organisms in the blood, there were many more who did not show evidences of an active infectious condition. Ordinarily the patients belonging to the first group suffered from fever, headache, pains in the limbs, and sleeplessness. During the first few days there was no visceral localization to be noted, except that in over half the cases there was a notable increase in the size of the spleen. The tongue was coated, the appetite poor, and constipation was noted. The urine was diminished in amount, clear in appearance, contained urates, and a small amount of albumin, and occasionally gave a positive diazo-reaction.

In order to make a positive bacteriological diagnosis the urine of all patients who gave evidences of a urethritis was cultured on an extensive surface in a preparation of 1 c.c. of bouillon to 1/10 c.c. of nutritive gelose. It was found that in healthy persons or individuals suffering from other than staphylococcic infections, staphylococci rarely occurred in the urine, that successive cultures did not reveal the staphylococci with regularity, and that when present, they were only found in the bouillon cultures. From this, the author concluded that the presence of staphylococci is significant only when the organisms grow on bouillon and gelose, when the colonies on the gelose multiply, and are of the same general type, and when they can be obtained several times in urine collected from the same patient. This occurs regularly in patients who have either a true staphylococcic septicemia or an attenuated form of sepsis without organisms in the blood. The organisms may be present in the urine during the first few days of the disease. In some cases of true septicemia the organisms may be found in the blood and *not in the urine* at the beginning of the disease; later they may be recovered from the urine. Usually when a few germs are eliminated in the urine they are eliminated for a very short period only and the urine becomes sterile a few days or weeks after the fever has subsided. The opposite of

this, however, may also occur. In some cases it took several months before the organisms had entirely disappeared from the urine.

Except for the presence of organisms, the urine is absolutely normal, and the patients show no clinical evidence of disease. The organisms may be present in very large numbers; 1-10 c.c. of urine cultured upon an extensive nutritive surface of gelose will show innumerable colonies of bacteria. This condition has been known for a long time clinically under the name of bacteriuria, and the majority of these bacteriurias are due to the colon bacillus.

In the author's case of staphylococcic bacteriuria all the steps of microbic infection were reestablished: (1) cutaneous infection; (2) blood infection; (3) urinary infection. The long duration of the elimination of the bacteria resembles in character the elimination of the *Bacillus typhosus* in the bile or in the urine of patients recovering from typhoid fever, who become typhoid fever carriers. This similarity to typhoid fever carriers is also seen in the resistance of patients with staphylococcic bacteriuria to the usual therapeutic procedures.

According to Nolf it is useless to sterilize the urine in these two types of patients by irrigations of the bladder, or by the internal administration of the urinary antiseptics. He looks upon these carriers as incompletely cured patients, in need of increased immunity, and as such submits them to a course of vaccine therapy consisting of intensive, properly prepared doses, injected *intravenously*. He found that the organisms disappeared in every case, usually after prolonged treatment. He applies the same method of progressive intravenous vaccine injections for bacteriuria caused by the colon bacillus. In one case an intensive course of subcutaneous vaccination was given, during which time several doses of ten billion organisms were injected without any effect whatever; when the organisms were injected intravenously a definite sterilization was produced by a dose of fifty million organisms. The therapeutic results in these cases, according to Nolf, show that the conception that bacteriuria is an infection of the urine, rather than of the urinary apparatus, is erroneous.

M. KESCHNER.

JOHNSON, W.: Symptoms of Hyperthyroidism Observed in Exhausted Soldiers. *The Archives of Diagnosis*, April, 1919, xi, No. 4, p. 260.

The observations of Cannon have shown that emotional upset produces an increased adrenin content in the blood; this in turn produces profound sympathetic activity, which is responsible for the physical manifestations of emotion.

Soldiers under recent military conditions were exposed to emotional stress for weeks without being able to perform the natural bodily movements which are expressions of emotion. The physiological circle is uncompleted and it seems possible that the accumulation of the excessive products of internal secretion may account for pathological conditions.

Fifty cases of men reporting from the battle line were received shortly afterward at a forward area. In all there occurred a definite condition of exophthalmos, and von Graefe's sign was well marked. Tremor was a constant phenomenon, affecting especially the fingers. The mental state was one of subdued excitement. The condition described in connection with "effort syndrome" was frequently found. Seven cases showed thyroid gland enlargement, the others a slight fullness of the neck. All were pale, looked ill, were exhausted, and complained of throbbing headache, dizziness, palpitation, precordial pain, digestive disturbances, frequent micturition, and irregular disturbed sleep. Their general state was one of quarrelsomeness and anxiety.

Exophthalmos is present in the early stage of advanced conditions of exhaustion and lasts usually only two or three weeks. When it disappears the patient is labelled "neurasthenia."

Exhaustion syndrome is the most suitable term for classifying the whole group. It has the advantage of not suggesting chronic invalidism.

L. B. ECKERSON.

PENDE, N.: Endocrinopathic Constitutions and Pathology of War. *Endocrinology*, July-Sept., 1919, iii, No. 3, p. 329.

The author has demonstrated clearly the importance of over-supply or deficiency of hormone as a cause of slight disturbances of health and shows that they may lead to real organic disorders.



Because of this functional imbalance, the psychoneuroses are induced by violent emotions or proximity to exploding shells. The symptoms produced are multiple and complex, but classify regularly under Basedow's, Addison's, diabetic, pituitary, genital, or thymolymphatic syndromes. The cause lies in the condition of constant endocrine instability; the cases most affected are of hyperthyroid status.

There are four principal types of so-called irritable heart: One presents the cardiovascular symptoms of early Graves' disease, observed in individuals who have hyperthyroid status and who present continual tachycardia, 100 to 120, without arrhythmia, but with slight increase of diastolic pressure. The second type shows the disorders described in vagotonic constitutions; there is arrhythmia, of the extra-systolic respiratory and juvenile type, and, when the individual is at rest, there is bradycardia, but no tachycardia except under strain and psychic excitation. The third type, myasthenia cordis, is found in individuals with small globular hearts unable to bear any strain. The fourth type includes those cases which, under stress, show symptoms of true myocarditis. This is seen among older men, recalled to the colors; their symptomatic syndrome suggests hypo-adrenalism.

The association of endocrine anomalies and infections is seen most frequently in cases of adrenalin insufficiency, and the prevalence of tuberculosis in this type is noteworthy.

Another type of imbalance is that in which hypothyroid symptoms are found. The thyroid body and adrenals are most easily affected by psychic influences.

L. C. JOHNSON.

WOOLLEY, PAUL G.: Report on Epidemic and Infectious Diseases in Camp Devens, Massachusetts. *The Journal of Laboratory and Clinical Medicine*, Oct., 1919, **v**, No. 1, p. 28.

The infectious diseases observed in the camp were influenza, measles, mumps, pneumonia, meningitis, scarlet fever, diphtheria, German measles, typhoid, malaria, small-pox, chicken-pox and the venereal diseases. Of these influenza, pneumonia, measles, mumps, and German measles were epidemic. Measles was from the start a disease of unseasoned rural troops, and it showed relatively fewer complications in this camp than in many others. With the excep-

tion of mumps, measles comprised the largest number of cases of infectious diseases during the period under discussion—785 cases in all. Pneumonia played a very large part in the morbidity and mortality rates of the camp. In a report from the Base Hospital it was held accountable for 45 per cent of all sick days. It was estimated that, exclusive of deaths from influenza-pneumonia, the mortality rate at this camp was about half that to be expected in a civilian population. Lobar pneumonia was more frequent in negroes, lobular (broncho-) pneumonia in white men. Pneumonia was found in 21 per cent of the cases during the above-mentioned period. There were 77 cases of empyema, 53 per cent of which were due to streptococcus infection; 17 per cent showed a mixed infection. Meningitis was relatively uncommon. Scarlet fever was not epidemic. Diphtheria was mild and readily controlled. Typhoid and paratyphoid did not originate in a single instance within the camp. With but one exception all of the few cases of malaria were in men from the southern states.

C. M. ANDERSON.

LOEB, LEO: Studies on Compensatory Hypertrophy of the Thyroid Gland. *Journal of Medical Research*, July, 1919, xl, No. 2, p. 199.

Loeb's studies upon the evidences of compensatory hypertrophy in the remaining portion of thyroid gland tissue of partially thyroidectomized guinea pigs show that the gland normally has a fairly wide physiological margin of safety. With the extirpation of less than one lobe, the remaining portion shows little or no tendency to hypertrophy. The hypertrophy is at the threshold after the extirpation of one lobe, is definite, though weak, after extirpation of one and a half or one and two-thirds of a lobe, and becomes very marked after the removal of the greatest part of the thyroid. The maximum hypertrophy seems to take place from the sixteenth to the thirtieth day after operation, regardless of the amount of tissue removed. Hypertrophy does not occur in the thyroids of fetuses of pregnant thyroidectomized guinea pigs.

TASKER HOWARD.

LOEB, L., AND HESSELBERG, C.: Studies on Compensatory Hypertrophy of the Thyroid Gland. II. (a) Hypertrophy in Autotransplants of the Thyroid Gland. (b) Does a Deficiency in Organ Function Influence the Transplantability? (c) Hypertrophy in Multiple Transplants of the Thyroid Gland. *Journal of Medical Research*, Sept., 1919, xl, No. 3, p. 265.

Loeb and Hesselberg report on a series of experiments which constitute a continuation of Loeb's work on compensatory hypertrophy of the thyroid gland. The viability and character of autotransplants, as affected by the amount of thyroid tissue removed, was studied. It was concluded that the physiological need of the organism for thyroid hormone had no influence upon the fate of the graft. Grafts grew as readily after the removal of a small part of the gland as after the removal of a large portion of it. When the graft took there was an early increase of mitoses, due presumably to the stimulation of the transplantation. Later increase of mitoses and hypertrophy were more or less proportionate to the amount of thyroid tissue removed (beyond a certain point), just as in the case of the remnant left *in situ*, and were taken to represent evidence of compensatory hypertrophy. The transplanted lobes of thyroid in the case of multiple transplantations had the same fate as the corresponding tissues in cases of single transplantation under otherwise similar conditions.

TASKER HOWARD.

KENDALL, E. C.: The Physiologic Action of Thyroxin. *Endocrinology*, April-June, 1919, iii, No. 2, p. 156.

The iodine compound of the thyroid which was first called "alpha iodine," is now named thyroxin. Successive daily administration of thyroxin produces the symptoms of hyperthyroidism, and death as a termination, while enormous single doses may be given intravenously, with hardly any demonstrable effect, in dogs and goats. When 200 mg. were injected intravenously in a dog, during fifty hours 43 per cent of the iodine was excreted in the bile, and 13 per cent in the urine; the remainder was probably removed from the blood stream by the thyroid gland. It seems probable that under normal conditions there is an equilibrium between the amount of thyroxin in the



thyroid, the blood stream, and the tissues, and that the latter fluctuates according to the energy demands of the body. In individuals with myxedema, the basal metabolic rate can be raised to any height, and so maintained by the injection of thyroxin, but there is a delay of days before the change occurs, and the reaction to a single injection continues for three weeks. Apparently the amount of thyroxin in the tissues determines the amount of activity of muscles, and while its absence does not produce death, it is necessary for a large and rapid energy output. It is concluded that thyroxin acts physiologically as a catalytic agent, and as such merely increases the rate at which the fundamental chemical reactions are carried out. When it is administered to an animal in repeated doses, there is a lag in the absorption of the substance by the tissues, and if the injections are stopped there is a return to the normal equilibrium, but if they are continued, the animal dies, not from toxicity of the substance itself, but on account of secondary reactions. The thyroid apparatus apparently permits a greater range of energy output than would exist without such a mechanism.

L. C. JOHNSON.

SMITH, G. E.: Fetal and Maternal Athyrosis. *Endocrinology*, July-Sept., 1919, iii, No. 3, p. 262.

The opinion is expressed that when this subject has been thoroughly explored many of the cases of infantile fatality and of arrested development of children, now designated as congenital, will be found to arise from a lack of function of the thyroid of the fetus which may be overcome by proper diet and conduct on the part of the mother during the gestation period. The occurrence of disorders of the teeth, nails, and hair during pregnancy indicates that there is a wide incidence of a more or less severe form of maternal athyrosis. The increase of the proteolytic enzymes of the pregnant woman tends to produce a condition similar to that under which fetal and maternal athyrosis are produced experimentally among domestic animals. Insufficient thyroid activity is noted as a cause of albuminuria and the toxemia of pregnancy, and may be overcome by an abundant supply of iodine. In treating the toxemia of pregnancy on a prolonged milk diet an abundant supply of iodine

should be given, to avoid untoward effects on the fetus. And when either parent suffers from a disturbance of the thyroid, iodine should be given throughout the gestation period. In such cases, from  $\frac{1}{2}$  to 1 grain (0.032 to 0.065 gram) of iodine daily should be given during pregnancy, menstruation, and for a period of seven days each month during puberty, particularly during the first three months of the year, since the seasonal variation of iodine in animal thyroids has been noted.

L. C. JOHNSON.

KAPLAN, DAVID: Syphilis and Its Serological Significance. *New York Medical Journal*, December 13, 1919, ex. No. 24, p. 969.

In his remarks introductory to the article, Kaplan emphasizes the importance of coöperation between the clinician and the laboratory man, in studying the clinical side of syphilis, and the necessity not only of taking into consideration the patient's antecedents, but also of having an eye for the future, thus possibly preventing the ravages of the disease. The correct interpretation of the various manifestations of visceral syphilis requires much more study and care than does that of the less difficult forms of syphilis of the skin and osseous system. Lues of the cardiovascular system may cause more serious trouble when improperly handled than syphilis of any other part of the body, with the exception of neurosyphilis.

As the result of the author's experience he is prepared to state that a positive Wassermann reaction is sometimes obtained in cases without lues which ultimately show no trace of this infection at post-mortem, and also that in some cases of syphilis salvarsan is at times contra-indicated, regardless of the presence of lues, and of a positive Wassermann reaction. He has seen instances where the heroic use of salvarsan could be held directly responsible for the patient's death. According to him it is the duty of every one who treats syphilis to note the degree of involvement, to carefully determine the amount of improvement possible without attempting to administer salvarsan or anything else *ad libitum*, and not to depend upon the serologist to indicate when the treatment is to be stopped.

Another factor requiring caution, a good clinical sense and the careful selection of the antileptic treatment, is the individual suscepti-

bility of the patient. Salvarsan should be given with extreme care to individuals with low blood-pressure, as arsenic tends to lower vascular tone. Exceptionally, one encounters patients who can tolerate enormous doses of salvarsan without any manifestation of chronic arsenical poisoning. In Dr. Kaplan's opinion, the practice of the adherents of the intensive method of treatment, with salvarsan, especially in neurosyphilis, is not a wise one, as equally good results may be obtained, and are actually secured, with smaller doses at rarer intervals. He questions the good judgment of physicians who give from 20 to 30 injections of salvarsan in from thirty to forty days, regardless of the patient's subjective good health, waiting only for a negative serological report.

The persistence or intensity of a positive Wassermann reaction, and for that matter its disappearance, are not in his opinion criteria for continuing or discontinuing antiluetic treatment. He bases his opinion on the following facts: (1) In early and in some late syphilis there is a corresponding diminution in the intensity of the positive Wassermann reaction. (2) In the present state of our knowledge, no one can be sure whether the phenomenon of a positive Wassermann reaction as an index to antibody-formation is not nature's method of combating the malady. (3) Certain diseases, such as scleroderma, leprosy, hepatic disease (chronic plumbism—Abstr.), etc., which are not even remotely associated with lues, and in which lues can definitely be excluded antemortem and postmortem, repeatedly give a positive Wassermann reaction. In view of these facts he doubts the wisdom of pushing intensive antiluetic treatment in cases of general improvement of the symptoms of lues, merely because the Wassermann tests remain persistently positive.

To practice neurology today without laboratory aid is almost impossible, but the author says that the laboratory physician "should have had a thorough and extensive clinical experience before he submits clinical opinions." The laboratory not infrequently reveals evidences of a pathognomonic nature which in some cases are the only signs available. Until recently the men using the intraspinal method of treatment of neurosyphilis championed this method simply because the cells in the cerebrospinal fluid from patients thus treated disappeared with phenomenal rapidity. This claim, in view of our present experiences, is not justified, because pleocytosis is no longer



considered to be an index of the presence or absence of lues, but merely shows that somewhere in the central nervous system the vascular membranes are in contact with some irritant, which need not necessarily be the spirochete. The reason for the rapid subjective and even objective relief after lumbar puncture lies in the fact that the nervous structures respond much more readily to the slightest kind of stimuli, and that when the pressure produced by an exudate is partially removed, the sensory apparatus responds at once. The relief from pain following lumbar puncture is especially marked in cases of posterior root irritation and in the hyperlymphocytic types of tabes. The proportion of polynuclear elements, according to Kaplan, plays a secondary rôle only and is to be utilized merely as an additional feature of good prognostic omen. Polynuclear leucocytosis usually accompanies recent acute exudates and rarely exceeds 10 per cent of the total cell-count, where the total number of cells to the cu. mm. is less than 100.

Under treatment, these polynuclear cells are the first to disappear in neurosyphilis, and with them the lymphocytes diminish to about half of the previous count. It is curious, but nevertheless true, that the smaller the original cell exudate the more difficult it is to bring about a normal cell-count in the cerebrospinal fluid. An important exception to the removal of pleocytosis by lumbar puncture is found in syphilitic meningitis, namely, that the severer the meningitis, and therefore the pleocytic exudate, the more rapid and far-reaching the results of treatment, both from a serological and from a clinical point of view.

As a rule an excess of globulin is accompanied by a pleocytosis, except: (1) in cases where local pressure from tumors or diseased bone conditions interferes with the proper function of the cord, (2) in cases of combined sclerosis of the cord, and in disease of the blood-vessels of the *conus medullaris*, as described by Elsberg and Kennedy. As to the origin of the globulin excesses in these conditions, nothing more is known than of their origin in syphilis, *i. e.*, that they are due to meningeal activities. In other words, they are hematogenous in origin.

Another important phenomenon in the serology of the nervous system is the colloidal gold test in the spinal fluid, and here the author emphasizes the fact that this test, whether positive or negative, does

not establish or exclude the presence of syphilis. A negative colloidal gold reaction establishes the absence of general paresis.

Of course, inasmuch as paresis is due to syphilis, its presence is confirmed by the colloidal gold curve. In this connection, Kaplan insists that he is opposed to the intraspinal or intradural methods of treating paretics. He says, "One should always bear in mind that they cannot be brought to normal in so far as the focal disease is concerned, and the most one can accomplish is a more or less durable period of lucidity, and for the time being, so to say, to extricate the patient from the class of antisocial beings. The prognosis is always bad, and the doctor who defers the period of decline is rendering all the assistance he can offer from the present therapeutic methods."

M. KESCHNER.

DICKER, WILLARD W.: Syphilis in Heart Lesions. *Illinois Medical Journal*, November, 1919, xxxvi, No. 5, p. 235.

During the last year Dicker made a careful inquiry into the etiology of the decompensated hearts of individuals who entered his service at the Cook County Hospital in Chicago, and he describes in this article the manifestations of those who entered during about five months of that time.

There were 44 cases in all, and of these 17, or 38 per cent, proved to be syphilitic in origin, 10, or 23 per cent, were rheumatic, 7, or 15 per cent, were arteriosclerotic, 8, or 18 per cent, were renal, and 2 cases, or 4 per cent, were of fatty hearts.

The author calls attention to the fact that these statistics were all from *male* patients entering the County Hospital with cardiac decompensation. He does not mean to draw the conclusion that 38 per cent of all cardiac lesions are syphilitic and only 23 per cent rheumatic, because if these figures included women the rheumatic percentage would naturally be much higher. These figures, in the author's opinion, simply show that if lues accounts for so many cases in the County Hospital, it must also account for the many in private practice, and therefore a careful consideration of the nature of the syphilitic involvement is fully justified.

The most apparent lesion is in the aorta. Small areas of inflammation develop in the middle coat, and later extend into the inner

coat. This produces a weakening of the vessel wall, which results in the dilatation. The aortic valves are involved later, giving rise to an aortic regurgitation, and subsequently the disease extends into the orifices of the coronary arteries, which are adjacent to the valves. When these two lesions are present the heart is permanently and badly damaged. In a large proportion of cases the heart-muscle shares in the involvement, and this accounts for the failure of the heart to respond to treatment. Bearing these pathological changes in mind, the author rightly insists that if treatment is to accomplish anything, it is of the utmost importance to make the diagnosis before the aortic valves, coronary arteries, and myocardium, are involved.

Early aortitis gives rise to very indefinite symptoms, and it is not very often that one is able to make a diagnosis before irreparable damage is done; but in some few cases this can be done, and in these the further progress of the disease may be stopped by active antisymphilitic treatment.

The earliest symptom in many cases is pain; this may vary from a mere transient feeling of tightness about the upper part of the sternum to the excruciating pain of true angina. Many patients have no pain until late in the disease. The other symptoms are even more indefinite; they are vague complaints such as general weakness, shortness of breath, hoarseness, a dry cough, and slight cyanosis. Before the valves are involved, physical examination may show only a slight increase in the aortic dullness, and this is usually difficult to make out. A loud second aortic sound is described by some as an important aid in diagnosis. Later, when there are evidences of aortic regurgitation and aneurysm, the diagnosis becomes, comparatively speaking, an easy matter, but then as far as treatment is concerned it is of no avail.

The most valuable information, however, may be obtained from the x-ray; in this way a very slight dilatation may be detected. Of equal importance is a positive Wassermann reaction, although a negative Wassermann does not exclude the possibility that the condition is syphilitic. At this point, the author emphasizes the fact that one cannot say that a positive Wassermann determines the diagnosis, but the absence of any other luetic lesion, and a knowledge of the frequency of involvement of the heart and aorta in latent syphilis, would lead one to strongly suspect an aortitis, if there were any symptoms or physical signs pointing to it.



The value of the therapeutic test in the diagnosis is well illustrated by the author in one of his cases, in which a man with a history of syphilis and a positive Wassermann had pain over the sternum with no other findings on *x*-ray or physical examination. This promptly cleared up under mercury treatment, although it had been present for many months, and resisted other forms of treatment.

The prognosis in cases of syphilitic heart disease, bearing in mind its pathology, is much worse than in the rheumatic variety. Once decomposition has set in, little or nothing can be done.

"The study of the effect of lues on the heart," says the author, "must lead us to the conclusion that the heart of every so-called cured syphilitic should be very carefully watched throughout his life and any abnormality should call for active treatment."

M. KESCHNER.

THOMPSON, L., AND KINGERY, L. B.: Syphilis in the Negro. *American Journal of Syphilis*, July, 1919, iii, No. 3, pp. 384-397.

*Origin of Syphilis in the Negro.*—There has been much uncertainty as to whether the American negro contracted the disease before or after being transported in slavery to this country. Alibert claimed that the negroes from Africa spread this plague in the New World; Leo Africanus stated that it was unknown in Northern Africa until introduced from Europe—probably by the Portuguese, according to Black. In any case it is practically certain that syphilis had appeared among the negroes before their transportation to this country.

*Prevalence of Syphilis in the Negro.*—Statistics on this subject are inconclusive, but there is a general consensus of opinion that the disease is far more common in the negro race than in the white. Quillian states that probably from 60 to 70 per cent of negroes have syphilis. Hospital statistics show a high percentage of syphilis among the negroes admitted.

*Etiology.*—The exciting cause of syphilis in the negro is the *Spirochoeta pallida*, as in syphilis in other races. The predisposing factors show certain differences:

- (1) *Idiosyncrasy—Immunity.*—It is questionable that the negro is any more or less susceptible in the disease than are other races. However, the sexual impetuosity of the negro may account for more abrasions in the integument of the sexual organs, and therefore for more frequent infections than are found in the white race.
- (2) *Age.*—No age is free from syphilis, but as the negro begins his sexual activity at an early age he is apt to contract the disease much earlier than do members of the white race.
- (3) *Sex.*—The social code which, in the white race, decrees that women must be more chaste than men, does not apply to the negro race, with the result that negro women are even more often infected than men.
- (4) *Civil State.*—Due to the "well-known looseness of morals among the negroes, permitting more or less promiscuous sexual intercourse regardless of marriage or lack of it, it would seem that the civil state has little or no bearing on the subject."
- (5) *Social Condition.*—Formerly, when the negro slaves were valuable property, they were carefully taken care of and their health safeguarded. There was, therefore, comparatively little syphilis among them. Now, since the Civil War, the negroes have had to shift for themselves. In many cases, the social conditions among them are deplorable, especially as to housing conditions. It is natural that where ten or twelve adults sleep in the same room there will be increased opportunities for venereal infection. Also, the negro is usually uncleanly in his habits and does not employ prophylactic measures of any sort.

*Clinical Manifestations and Pathology.*—Negro luetics present a peculiarity of type, or a greater frequency of certain types, than is usually found in whites.

- (1) *Chancre.*—Twenty per cent of the author's cases showed chancre, principally characterized by indolence of development. Extragenital chancres are extremely rare in the negro race.

- (2) *Skin Lesions*.—The author quotes Hazen as saying: "Macular and maculopapular eruptions are not common in the negro." On the other hand, the annular lesion of early syphilis seems to be peculiar to the negro race. "The lesions are regular in outline, discrete, sharply-defined, and indurated. They vary in size from a few millimeters in diameter to the size of a quarter or larger. The lesion proper is definitely raised from the surrounding integument; often it presents a white scale, and encloses an area of apparently normal skin, which occasionally shows some increase in pigmentation. Lesions occur most frequently on the forehead, chin, about the alæ, and occasionally on the neck and trunk. Here again the indolence of the disease in the negro is characteristic.
- (3) *Mucous Membrane Lesions*.—This type of lesion seems to be particularly common in the negro race, but the lesions themselves do not differ in degree from those appearing in white individuals, except perhaps in the frequently observed hypertrophic tendencies.
- (4) *Condyloma Lata*.—Broad condylomata seem to occur more frequently in the negro, but do not differ from those observed in the white race. Personal hygiene probably plays an important rôle in their occurrence.
- (5) *Adenitis*.—Lymphadenitis, which in the white race is an important diagnostic factor, occurs so frequently in negroes as to be of little value in diagnosis.
- (6) *Appendages*.—Involvement of the appendages seems to occur with equal frequency in both races.
- (7) *Osseous Lesions*.—The consensus of opinion is that the osseous system is more frequently involved in the negro than in other races.
- (8) *Visceral Involvement*.—As a rule the circulatory, respiratory, gastrointestinal and genito-urinary systems are not frequently involved in the negro.
- (9) *Central Nervous System Involvement*.—The author has found few cases of tabes or general paresis, or signs of earlier involvement.



*Congenital Syphilis in the Negro.*—The majority of cases among negroes are acquired, probably due to the fact that congenitally syphilitic negro babies do not survive.

*Diagnosis.*—Syphilis in the negro may be diagnosed as in other races. Circinate or annular syphilids are more common in the negro than in whites and must be distinguished from certain other conditions, such as erythema multiforme, psoriasis, and tinea circinata. The most conclusive diagnostic factors are the finding of *Spirochoeta pallida* and the Wassermann test.

*Prognosis.*—The chances for recovery are not as favorable in the case of the negro as in that of the white, for the former only undergoes treatment when his lesions are acute, and is remiss at other times. On the other hand, the most fatal involvements of the central nervous system, tabes and paresis, are rare in the negro.

*Prophylaxis.*—The author recommends that the negroes be taught the use of prophylactic packages, that syphilis be made a reportable disease in all places, with severe penalty for failure to report cases, that free clinics be made available and treatment be compulsory. Such measures should include whites and negroes alike. It is difficult to teach the negro that sexual indulgence during the acutely infectious stages of the disease is wrong, and therefore public lectures, exhibits, pictures, etc., on the subject of sex hygiene are of less avail than among the whites.

*Treatment.*—The response to treatment seems to be the same in both races. In spite of the negro's poor mouth hygiene his teeth are good, and his tolerance for mercury as good as that of other races.

EDITORIAL: Placards Posted in Trains Produce Big Results. Section on Venereal Diseases and the Hospital. *The Modern Hospital*, Jan., 1920, xiv, No. 1, p. 71.

The Government placards concerning venereal diseases, posted during the past year in the toilet rooms of railroad cars and stations, have resulted in many letters of inquiry being sent to the U. S. Public Health Service, 228 First Street, N. W., Washington, D. C. This organization is receiving as many as from 600 to 700 letters a week on the subject. Free information in the form of pamphlets is sent to any one making application to the above address. The pamphlets are under six headings: (a) for young men; (b) for

officials and the general public; (c) for boys; (d) for parents; (e) for girls and young women; (f) for educators.

B. V. H. ANTHONY.

VAUGHAN, V. C.: Sex Attraction. *The Journal of Laboratory and Clinical Medicine*, Nov., 1919, v. No. 2, p. 114.

Dr. Vaughan gives a very thorough study of this subject, emphasizing especially the evolution of life from the asexual to the sexual form, the extent of differences between man and woman, the causes of sex attraction, the influence of sex for good or evil, the dangers of sex attraction and how to meet them, the way to deal with venereal disease, and the influence of heredity and environment on the sex question.

In no other species except the human is the exercise of the sex function so completely under the control of the individuals who possess it. This power of control places the responsibility where it belongs. It make the parent responsible for the child. It makes the present generation responsible for generations to come.

The development of sex has led to differences in every part of the body, and has touched the finest and most delicate mechanism of life, even the intellectual and moral being, and it is probable that differences between the male and the female exist in every part of the body.

The point is made that absolute continence is compatible with health, efficiency and happiness, but that disease of the sexual glands is incompatible with any and all of these.

The differentiation which has been necessary in the development of the sexes in the genus homo has made one the complement of the other and has resulted in sex attraction, by which is meant the pleasure and the mental satisfaction that comes to two persons of opposite sex when brought into association, and which may be quite apart from the function of reproduction.

The dangers of the period of development in girls are brought out, and the need of proper instruction, lack of which may result in the girls going astray. When puberty is reached girls should know themselves and the dangers to which they are quite sure to be exposed. They should know the fundamental facts of anatomy

physiology, and hygiene, and their application to themselves. Ignorance has brought disaster. Let us try knowledge.

Boys should be told frankly about the effects of gonorrhea and syphilis. Chivalry should be played upon and the wrong to girlhood emphasized.

Houses of prostitution should be abolished, as their existence renders it all too easy for young women to do themselves irreparable harm.

Venereal diseases must be dealt with just as other infectious diseases are. The cases should be reported, just as small-pox is, and the patients should be segregated, not in houses of prostitution, but in hospitals. To contract a venereal disease is not a crime, it is a misfortune; but to infect another with venereal disease is a crime, moral if not legal. Provided that a complete and unquestionable cure can be effected, the question of permitting marriage becomes strictly a moral one. A person should not be lastingly condemned for a mistake.

Both heredity and environment are important factors in the sex question. Proper association of the sexes is probably the strongest force in the uplift of the race; for who can measure the power for good that women have over men?

The central purpose of sex attraction is reproduction; therefore there should be something worthy to be reproduced. The silly moron girl is not the type for reproduction, nor is the vicious, immoral boy. Our efforts should be directed toward the extinction of both of these.

C. M. ANDERSON.

BLACKADER, A. D.: On Acidosis. *Canadian Medical Association Journal*, November, 1919, ix, 978.

The term acidosis is now limited to conditions in which the reserve alkaline salts of the blood have been greatly diminished in amount. As a result of the well-balanced metabolism which is continually carried on in the living body, there is a constant production, variable in amount and character, of acid radicals in the system. These are prevented from interfering to any extent with the normal alkalinity of the blood by the processes of oxidation, neutralization and elimination. These three processes are under the control of the regulating centers in the body, and are continuously active. Owing to



the presence in the blood of so-called "buffer" salts, a maximum amount of acid can be neutralized with a minimum amount of change in reaction. This is due chiefly to the presence in the blood-plasma of phosphates of sodium and potassium, and partly also to the presence of colloidal protein, which has a definite influence in maintaining an amphoteric reaction. Thus we find that a solution of acid sodium phosphate has an acid reaction; a solution of ordinary sodium phosphate has an alkaline reaction, but almost any mixture of the two salts is neutral to ordinary tests for acidity, and such a mixture will take up strong acids or alkalis in fairly large quantities, with only a very slight change in the reaction. The ratio between the amounts of the several ingredients may change, but the alkaline reaction remains unaffected.

Free carbon dioxid is present in body fluids at all times, in combinations and free, and in such concentration and amount that it automatically converts all bases not bound by other acids into bicarbonate. The bicarbonate content represents the excess of basic salts left in the blood after the non-volatile acids have been neutralized, and also the amount available for neutralization of any further amount of acid which may enter the blood. This is considered the alkali reserve of the body, and is maintained in health at an almost constant level. A serious diminution of the normal amount immediately results in the production of acidosis.

The oxidation of carbon, phosphorus, nitrogen, and sulphur, results in the constant elaboration of acid and acid radicals, which find their way into the blood. To maintain the normal alkaline reaction, these acids and acid radicals must be neutralized. The body of a healthy individual accomplishes this in three ways, so that the neutralization takes place with little strain, and the alkaline reserve remains a constant.

(1) Acids elaborated in the body, or introduced from without, displace the carbon dioxid from the alkaline carbonates in the blood, setting the carbon dioxid free to be removed by pulmonary ventilation. A neutral or acid salt is formed, which is promptly eliminated by the kidneys. Alkaline salts of soda and potash are introduced in the food to supply the blood-plasma.

(2) The eliminating power of the kidneys is the second defense of the normal alkalinity of the blood. Although the kidneys secrete

an acid urine from an alkaline blood-plasma and acid salts from an alkaline serum, it is remarkable how sensitive normal kidneys are to changes in the amount of acid phosphate in the blood and how they adapt their function to the varying amount of acid salts in the plasma. The prompt elimination of these acids forms a most important protection to the normal alkaline reserve in the blood. Disease of the kidneys, however, seriously interferes with this elimination; acid salts may accumulate in the blood and induce symptoms of acidosis.

(3) The system's reserve power of intercepting the ordinary metabolic process for the conversion of excessive nitrogenous material into urea, and of forming ammonia, instead, is another safety device for the neutralization of any excessive acid formation.

In spite of these defences there are two important conditions in which acidosis may develop. The more common of these is diabetes, in which, owing to a disturbance of the carbohydrate metabolism, an enormous excess of acid radicals are formed in the system. These make heavy demands on the alkaline reserve of the blood and call forth all the latent ammonia-producing power of the system. In such cases it is found that an abnormal excess of nitrogen is produced from the breaking-up of the proteins, so that the amount of ammonia produced in defence of the alkali reserve is considerable.

The percentage of urinary nitrogen eliminated normally does not exceed 2 or 3 per cent, but in diabetes and in similar conditions of disturbed carbohydrate metabolism it is found that from 10 to 40 per cent of nitrogen, ordinarily excreted as urea, is now excreted as ammonia. In spite of this effort of the body to save all the possible alkali reserve in the blood, there is always in diabetes the great liability to its depletion, with consequent acidosis and coma.

The second condition in which acidosis may develop is nephritis—chronic diffuse nephritis in the adult and the severe acute forms of nephritis in children. Symptoms of acidosis developing in nephritis are due almost entirely to a defective elimination of acid phosphates. This condition is met with chiefly in parenchymatous nephritis, and in the early stages of chronic interstitial and arteriosclerotic form, and it may develop and become very marked in uremia arising from any form. A similar condition is sometimes seen in children in whom the urinary output is greatly diminished, owing to a profuse

watery diarrhea, or to a high fever with a limited intake of water. In all of these conditions there is an accumulation of acid salts in the blood, which diminishes its bicarbonate reserve and its normal alkalinity, and increases its hydrogen-ion concentration.

The lungs constitute a safety-valve against this condition, because the slightest increase of this hydrogen-ion content in the blood causes stimulation of the respiratory center. It has also been proven that reduction of the normal bicarbonate constant in the blood results in a diminished capacity of the blood to convey carbon dioxid from the tissues to the pulmonary alveoli. The slightest changes in the amount of the hydrogen-ion concentration stimulate the respiratory center, resulting in frequent and deep breathing, which increases the amount of oxygen absorbed, and the amount of carbon dioxid thrown off. This leads to an increased supply of oxygen to the tissues, with a consequent diminution of carbon dioxid in the plasma. These facts explain why, when the hydrogen-ion concentration continues to rise in amount, the patient takes deep, pauseless breaths, and why the blood in his veins is not cyanotic but rather brighter than usual. In this condition both the pulmonary alveolar air and the blood-plasma show a marked diminution of the carbon dioxid tension; from a normal of 35-40 it may sink to 25, or even 15. If early in this condition the alkali reserve in the plasma is restored by giving soda bicarbonate in sufficient amounts by mouth or intravenously, the symptoms rapidly subside; otherwise the breathing becomes deeper, the patient becomes stuporous, and life terminates in a comatose condition.

Acidosis, therefore, is not merely an increased production of acid in the system, or an increase of acid salts in the blood (both of these favor its development), nor is it necessarily connected with the presence of ketones in the blood or in the urine. The important factor is the depletion of the alkali reserve with an increase of the hydrogen-ion content in the blood. The condition may be produced in various ways. It may be due to an excessive production of acid in the system; it is rarely due in man to an ingestion of large amounts of acid or to a lack of alkali in the food. It may be due to a failure of the kidneys to eliminate the acid salts in the blood. Associated with any of these causes may be a failure to produce a sufficiently large amount of ammonia.



The early stage of danger is recognized by increased deep, pauseless breathing, without cyanosis and with no physical signs of respiratory obstruction. The amount of soda bicarbonate required to render the urine alkaline is not only an index of the degree of the acidosis but is also a rational therapeutic agent. In a normal adult 77.16 grains (5 grams) of the drug dissolved in a glass of water will, in an hour or two, change the usual acid reaction of the urine to an alkaline one. In some cases, a second dose of 5 grams may be given at the end of two hours. In threatening acidosis, much larger quantities may have to be employed. The author calls attention to the fact that the administration of this simple drug requires both judgment and the exercise of caution to avoid great excess. Large amounts may irritate the mucous membrane of the gastro-intestinal tract. If given subcutaneously the solution should not exceed 2 per cent in strength, and must be given under aseptic precautions. When given intravenously, the solution should not exceed 4 per cent in strength. It is well to bear in mind that solutions of sodium bicarbonate cannot be boiled without the liability of converting the bicarbonate into the carbonate; if this occurs, sloughing of the surrounding tissues may result.

In all cases of acidosis, the urine should be examined to determine the quantity of ammonia. Any excess of ammonia found should be compared with the total nitrogen retention, as an excess of ammonia may be found after a diet rich in proteids, and also in diseases causing an excessive catabolism of protein. In some cases the urine may show an excess of acid salts, or large amounts of oxybutyric acids; but any such examination of the urine presupposes a normal efficiency of the kidneys to excrete acid salts. Failure to excrete these salts is the source of danger in some cases. The determination of the carbon dioxid tension of the alveolar air and of the blood are most important laboratory tests for acidoses.

Acidosis in the adult, with the exception of diabetes, is not very common. It is occasionally met with in some forms of nephritis, more rarely in some cases of rheumatic fever, in a few cases of pneumonia, and in severe burns; it may also be seen after hemorrhage and shock. It is much more frequent in infancy and childhood. According to Blackader, *acetonemia* is frequently met with, but is generally of slight importance.

*Acetonuria* is of frequent occurrence, and is in most cases due to errors in diet or to a deficiency of proper food. Frew examined the urine of 600 consecutive cases of children entering the Great Ormond Street Sick Children's Hospital of London and found acetone bodies on the third or fourth day in 60 per cent of the cases. Holt found acetone bodies in the urine of 30 per cent of 200 consecutive cases entering the Babies' Hospital of New York. In both instances the condition was temporary, did not appear to disturb the general health, and was attributed to the difficulties of feeding these children during the first few days of hospital life.

Acetone bodies may also be found in the urine of children suffering from infectious fevers, but they do not appear to add to the severity of the disease in any way.

Blackader takes exception to the statements generally made that while the appearance in the urine of acetone indicates a mild disorder of metabolism, the presence of aceto-acetic acid signifies a more serious disturbance, and the presence of oxybutyric acid one still more severe. He claims that all three bodies may be found in the blood, even in comparatively good health. Recurrent or cyclic vomiting has been attributed to a mild state of acidosis. Marfan states that acetonuria is invariably present, and that in some cases the ketone bodies are in great excess. Nevertheless it is not thought at present that the condition is due to the production of acetone bodies or to acidosis. The author, however, concludes the article by emphasizing the importance of "recognizing the fact that in children acetone body acidosis, sufficiently severe to cause death, may develop suddenly, apparently spontaneously, that mere starvation cannot be held responsible, and that some underlying and very obscure metabolic disturbance is thus far the only suggested cause."

M. KESCHNER.

ROTHSCHILD, M. A., AND WILENSKY, A. O.: Cholelithiasis. *The Medical Clinics of North America*, Sept., 1919, iii, No. 2, p. 417.

The essential features of the article are summarized by the authors as follows:

The aseptic formation of biliary calculi occurs, and a special type of stone characterizes this condition.

Disturbances of cholesterol metabolism are intimately associated with the formation of these stones.

The cholesterol content of the blood *per se* cannot be used as a diagnostic criterion.

The cholesterol content of the blood, taken in conjunction with the anatomic and pathologic findings, is of great service in analyzing the individual case. This point is especially valuable in the after-treatment of those cases of so-called chronic cholelithiasis in which repeated operations are performed. By recognizing the diathetic element involved, it is possible to keep this group free from symptoms for long periods.

In those cases of cholelithiasis with hypercholesterinemia in which no obstructive cause for the hypercholesterinemia can be found, adequate biliary drainage should be instituted.

The return of the cholesterol metabolism to the normal state, as determined by chemical examination of the blood and bile, gives the indication for the removal of the drainage-tube.

Cases belonging to this group should be followed up, and repeated examination of the cholesterol content of their blood made. If a case again becomes hypercholesterinemic, the patient should be put on a diet relatively free of fats and lipoids.

H. WOLFER.

OBATA, ISEI: On the Nature of Eclampsia. *The Journal of Immunology*, May, 1919, iv, No. 3, p. 111.

Isei Obata finds that the saline extracts of all organs and tissues of the body contain a poisonous substance when injected into the body. This is true of the placenta.

In its capacity to neutralize the poisonous action of placental extract the serum of eclamptic women is much inferior to that of normal individuals, whether male or female; the normal capacity of the serum in this respect is restored in eclamptic women on the fifth or sixth day after labor. This abnormality of the serum in eclampsia is not brought about by the convulsion itself. Furthermore, not only has a marked resemblance between the symptoms produced with the placental extract and those of the eclamptic attack, been pointed out, but an almost perfect agreement has been found be-



tween the anatomical features of eclampsia and those of animals killed by repeated injections of placental extract.

From these facts one feels justified in drawing the conclusion that in reality eclampsia is nothing but intoxication by the placental poison, rendered possible by a weakening in the normal capacity of neutralization on the part of the maternal blood.

The clinical symptoms, as well as the anatomical alterations mentioned are, of course, not peculiar to intoxication by the placental extract, as has been shown by several authors (Dold and Ogata, Kinoshita, Takeushi). However, the derivation of the injurious agents in eclampsia from the placenta seems indicated by the remarkable fact that the symptoms cease when the placenta has been removed. It is true that eclampsia does occur in rare cases after the discharge of the placenta, but not after a period of twenty-four hours following the placental discharge. Even for this phenomenon, however, there is an analogy in animal experiments with the placental extracts in those instances in which the symptoms developed several hours after the injection of the extract, or, as rarely happens, when a second paroxysm occurred as late as ten hours after the injection. It may also be suggested that this later occurrence of eclampsia may be the symptom-complex of intoxication by a poison produced by autolysis of the uterus itself as a part of the process of involution of that organ. The idea is rendered plausible by the fact, proven by Yoshomura, that uterus extracts contain a poison.

While the foregoing investigation leaves little doubt as to the nature of eclampsia, one question still remains open—namely, what causes the weakening of the neutralizing capacity of eclamptic serum? Work on this question is still in progress.

W. LINTZ.

REGAN, J. C., AND SILKMAN, A.: Report of a case of Human Rabies. *The Archives of Diagnosis*, April, 1919, xi, No. 4, p. 237.

*Case.*—Female, aged four and a half years, admitted to Kingston Avenue Hospital, Feb. 13, 1919, at 10.50 a. m. Died the same day at 8.55 p. m. She was bitten on the face by a stray dog, Jan. 20th.

About twenty minutes later the three skin wounds were cauterized with silver nitrate stick. Next day the bites were again cauterized and antirabic treatment was begun and continued for twenty-one successive days. On the last day of treatment rabic symptoms developed and the child died that night. Necropsy showed the viscera to be normal, except for congestion of the lungs, liver and spleen. The spinal cord showed no gross change. The meninges were congested with areas of hemorrhages throughout brain substance, and negri bodies were present in the nerve-cells of the cerebellum. The cerebrospinal fluid was not increased in quantity.

This case illustrates a rare instance of failure of the Pasteur antirabic treatment. The incubation period was extremely short.

*Treatment of Rabies.*—(1) *Local measures* should be applied to the wound within forty-eight hours after the dog bite. Nitric acid has distinct advantages over other chemical caustics in its powers of penetration and diffusibility, and it does not cause coagulation of tissues. Puncture wounds should be opened widely before cauterization. The wound should be allowed to bleed freely, and should not be closely sutured.

(2) *Antirabic treatment* should be instituted on the first or second day. The mortality is very low if this is commenced within the first week. The material injected consists of a saline emulsion of the spinal cords of rabbits that have died of fixed virus infection: 0.2 per cent of phenol is added as a preservative. The quantity injected is greater at the beginning, while the potency of the material given is gradually increased. Injections are made for twenty-one successive days. A patient bitten by a positively known rabic animal should receive a second series of injections after the expiration of six months.

*Treatment When Disease is Established.*—No specific method has been proved to exist, but hygienic, palliative, and sedative measures should be instituted religiously.

The control of rabies depends upon: publicity and the institution of proper federal laws regulating the importation of dogs; the compulsory impounding of all stray animals, and the proper supervision of all licensed dogs.

L. B. ECKERSON.

## SECTION ON

# LABORATORY AND RESEARCH

WATTERS, H. W.: Vaccines in Influenza. *Boston Medical and Surgical Journal*, Dec. 25, 1919, clxxxi, No. 26, p. 727.

Results of the prophylactic use of vaccines are recorded in the following tables:

A mixed vaccine was prepared as follows:

Micrococcus catarrhalis .....	400,000,000
Pneumococcus .....	400,000,000
Streptococcus hemolyticus .....	400,000,000
Bacillus influenzae .....	100,000,000

The recommended dosage was .2 c.c., .3 c.c., .4 c.c., administered at three-day intervals.

The first immunization were performed upon the laboratory staff. Of 14 on the staff, 10 received injections, none of whom developed influenza; of the other 4, 2 had severe cases. The nurses were immunized. The results follow:

Not vaccinated.....	41	Sick..	33 (80 per cent)
Vaccinated once .....	27	" ..	9 (33 per cent)
Vaccinated twice .....	9	" ..	3 (33 per cent)
Vaccinated three times..	6	" ..	2 (33 per cent)

In a factory 19 employees were inoculated. One refused and developed the disease, this being the only case.

Careful studies of the employees of a milk company in Boston gave the following results:



	Vaccinated	Not Vaccinated
No. of persons under observation....	247	300
No. cases of influenza.....	17	93
No. cases of pneumonia.....	2	5
Percentage of influenza.....	6.8	31
Percentage of influenza mortality..	0	4.3

A similar study was made of four other commercial houses at the same time with the following results:

<i>Group I.</i>	Vaccinated	Not Vaccinated
No. persons under observation.....	250	200
No. cases influenza.....	3	75
No. cases pneumonia.....	0	4
Percentage of influenza.....	0.8	30
Percentage of influenza mortality..	0	2.7

<i>Group II.</i>	Vaccinated	Not Vaccinated
No. persons under observation.....	329	339
No. cases influenza.....	3	9
No. cases pneumonia.....	0	1
Percentage of influenza.....	0.9	2.7
Percentage of influenza mortality..	0	11

<i>Group III.</i>	Vaccinated	Not Vaccinated
No. persons under observation.....	90	25
No. cases influenza.....	5	18
No. cases pneumonia.....	0	1
Percentage of influenza.....	5.5	72

<i>Group IV.</i>	Vaccinated	Not Vaccinated
No. persons under observation.....	185	100
No. cases influenza.....	0	90
No. cases pneumonia.....	0	...
Percentage of influenza.....	0	90

In the Allentown State Hospital the vaccine was used with the following results:

	Vaccinated	Not Vaccinated
No. of cases under observation.....	722	575
No. cases of influenza.....	61	186
No. cases of pneumonia.....	11	77
Percentage of influenza.....	8.4	32.4
Percentage of influenza mortality..	13.1	17.7

The vaccine was sent to many practicing physicians and the results were reported, which summarize as follows: Out of 1,473 patients inoculated, 21 contracted the disease, 2 had pneumonia, and no death occurred.

Combining all the figures the author states that the disease incidence in the inoculated was 3.5 per cent, while at the same time in the uninoculated it was 28 per cent. Among those immunized only 15 cases of pneumonia were reported. From the figures quoted the author concludes that there is a period of from three to five weeks after inoculation during which a distinct immunization exists.

M. M. BANOWITCH.

Roos, C.: Notes on the Bacteriology, and on the Selective Action of *Bacillus Influenzae* (Pfeiffer). *Journal of Immunology*, July, 1919, iv, No. 4, p. 189.

*Bacillus influenzae* may be found in every case of true clinical influenza. To isolate this organism, which is most abundant in the earlier stages of the disease, it is necessary to exercise care in obtaining a suitable specimen, and since the growth requirements of this organism are quite rigid, special selective culture media, such as those selected by Avery, and also by Fleming, carefully prepared and adjusted to reaction, are essential for successful work.

The various strains of *Bacillus influenzae* apparently do not differ in kind. This is indicated by the cross agglutinations, absorption and protection tests with strains isolated at different localities during the recent pandemic, as well as with those from the epidemic of a few years ago—1915 to 1917.

The toxic substances of *Bacillus influenzae* show a marked action on the bronchorespiratory tract, thereby predisposing these organs to extensive invasion by the organism itself, or to secondary infection.

No marked increase in virulence of *Bacillus influenzae* has been obtained by passages through laboratory animals. This may be due in the first place to the relative insusceptibility of these animals to the infection of this organism, secondly to the probability that the invasive power of the organism is very limited, infection apparently taking place only when the initial toxicity is severe enough to facilitate such invasion.

No bacteriemia is produced by *Bacillus influenzae* in laboratory animals by a dose approximating a minimum lethal dose, regardless of the mode of injection chosen. Rabbits receiving intracranial injections may die of acute toxemia and show no organism in the blood stream or lungs, or, when such infection passes into the subacute stage, there is apparently a chance for a few of the organisms to pass into the blood stream and to be transferred to such organs as the lungs, when these have been rendered susceptible to the toxic substance of the organism.

The pathological lesions in the rabbit, gross and microscopic, resemble, in many respects, those of the *Bacillus influenzae* in human beings, as observed during the past pandemic.

The injection of *Bacillus influenzae* into the rabbit intravenously results in a rapid and marked decrease in the polymorphonuclear cells.

W. LINTZ.

WOLSTEIN, M.: Pfeiffer's Bacillus and Influenza. A Serological Study. *The Journal of Experimental Medicine*, Dec. 1, 1919, xxx, No. 6, p. 555.

Serological reactions of Pfeiffer's bacillus with a serum of recovered patients, as well as with monovalent immune rabbit sera, showed that the agglutinations were irregular and not satisfactory. The Department of Health, New York City, found the Pfeiffer bacillus in from 80 to 100 per cent of influenza patients. The bacilli isolated from different cases did not produce identical immune bodies in inoculated animals as measured by the agglutinin absorption test.



Complement-fixation reactions were almost always positive with antigens made from more than one strain of the bacillus.

It is shown that the sera of patients convalescent from influenza yields reactions for agglutinins, precipitins, and complement-binding bodies with antigens of Pfeiffer's bacillus. These reactions appear constantly at the end of the first week, increase in intensity during the second week, remain demonstrable for from two to four months, and are most complete in the sera of postinfluenza pneumonias. The strains of Pfeiffer's bacillus isolated during the epidemic were morphologically and biologically similar to the strains isolated from influenza cases in other years; antigenically they differed from them only quantitatively. The patients' serological reactions indicate the parasitic nature of the bacillus, but are not sufficiently stable and clean-cut to signify that this bacillus is the specific inciting agent of epidemic influenza. They do, however, indicate that the bacillus is at least a very common secondary invader in influenza, and that its presence influences the course of the pathological process.

H. M. FEINBLATT.

WADE, W. H., AND MANALANG, C.: Fungous Developmental Growth Forms of *Bacillus Influenzae*. *The Journal of Experimental Medicine*, Jan. 1, 1920, xxxi, No. 1, p. 95.

Bacteriological findings during the influenza epidemic strongly indicated that the Pfeiffer bacillus played an important part in the disease. Accordingly, attempts were made to determine, if possible, the essential factors influencing its pathogenicity. Yanagisawa reported the effect of simultaneous injection of *Bacillus influenzae* and streptococci or pneumococci into white mice. Attempts were made to duplicate the experiments by cultivating the organisms together in fluid media. At the same time an attempt was made to determine whether a filterable stage might be produced in bouillon or in the synthetic media of Lohnis and Smith, with and without added blood extract (hemoglobin). The development morphologic changes which appeared in certain of these first cultures were so surprising that more extensive observations were made of this feature. The organisms used were typical strains of the influenza bacillus, obtained from autopsies.

It was found that three different strains of an organism supposed to be *Bacillus influenzae* would, under certain conditions, abandon the

usual bacillary form and grow as a frank fungus, morphologically of the discomyces type. Under other conditions they show fewer modifications, the most striking feature being the production of conidiospores, bodies of a type not found in true bacteria.

H. M. FEINBLATT.

MATZ, P. B.: Laboratory Studies in Influenza at Camp Travis, Texas. *American Journal of Medical Sciences*, Nov., 1919, clviii, No. 5, p. 723.

Throat cultures were made in 868 cases on defibrinated blood-agar plates. The Pfeiffer bacillus was isolated from 344 of the throats examined. Streptococcus was found 108 times; pneumococcus, 83; and *Micrococcus catarrhalis*, 52. A large number of bronchopneumonia cases occurred. The sputa, including typing, showed the pneumococcus and *Bacillus influenzae* predominating. The pneumococcus was of Type IV. Blood cultures in the complicating bronchopneumonias gave positive results in 11 per cent of cases. The pneumococcus was the organism found. Blood cultures in the influenza cases were all negative. Two thousand urine examinations of cases of bronchopneumonia were made, and 385 showed albuminuria; 53 of these patients died, and the postmortem showed acute parenchymatous changes in the kidneys. In the average case of influenza there was a slight leukopenia, with a relative increase of small mononuclears. When bronchopneumonia developed there followed a slight increase in the total leukocyte count and increase of polymorphonuclears. Urea nitrogen was retained in the blood in pneumonias having no kidney involvement. Blood chemistry in the emphysema cases showed a retention of urea nitrogen. Acidosis was a factor in many bronchopneumonias, evidenced by a reduction of the combining power of blood plasma for CO<sub>2</sub>.

A. T. MAYS.

FISCHER, ALBERT: Multiple Tumors of the Mouse Mamma. Are They Independent or Metastatic? *Journal of Cancer Research*, April, 1919, iv, 325.

The author investigates the question set forth in the title by following the course of pigment particles (India ink) after their injection into the nipple of normal and cancerous breasts of the mouse.

upon the assumption that the same course is followed by the cells of mammary cancer in the production of metastases.

The particles were found always to be carried to the regional lymph-nodes, sometimes to the nodes on the opposite side. They were never found in another mamma.

From these findings the author concludes that multiple tumors of the mouse mamma are to be looked upon as independent growths rather than as metastatic tumors.

A. F. COCA.

LATHROP, A. E. C., AND LOEB, LEO: Further Investigations on the Origin of Tumors in Mice. IV. The Tumor Incidence in Later Generations of Strains with Observed Tumor Rate. *Journal of Cancer Research*, April, 1919, iv, 137.

Continuing their previous study of the influence of heredity on the incidence of spontaneous tumors in various stains of mice, the authors report:

(1) In the majority of cases the rate of incidence remained constant in each strain.

(2) In exceptional cases the rate increased while in a number of the strains the rate has distinctly fallen.

(3) These changes in the rate of incidence are probably due to:

(a) Differences in resistance to disease or in prolificness in various families of the same strain, or to other more or less accidental factors, which cause certain families with a different cancer rate to preponderate to an unequal degree in earlier and later generations. Thus an apparent change in the whole strain is due only to the effect of selection among certain constituents of the strain.

(b) Changes in certain characteristics of a strain, resulting from long-continued inbreeding. Such strains become less prolific and less vigorous, and a lowering of the tumor rate goes hand in hand with this change.

(4) In the majority of cases the age class in the later generations remained approximately the same as in earlier generations. The observation is confirmed that in strains with a low tumor rate the tumors tend to appear in the later period of life.

A. F. COCA.



GASSER, H. S., ERLANGER, J., AND MEEK, W. J.: Studies in Traumatic Shock. IV. The Blood Volume Changes and the Effect of Gum Acacia on Their Development. *American Journal of Physiology*, 1919, 1, 31.

Attention is called to the fact that earlier studies all pointed to a decreased effective blood volume as the only constant factor tending toward the failure of the circulation. The present experiments were undertaken to determine the rôle played by the absolute volume of the blood in the reduction of the effective volume in shock, and to evaluate the possible modes by which a reduction might be brought about. Three possibilities were investigated: hemorrhage, concentration of the blood and stasis in a portion of the vascular bed. After a description of the technic employed, the investigations under each head are given in detail. The following conclusions are reached: In every case studied shock was associated with a concentration of the blood and a loss of volume. In a large portion of the cases the total loss of volume can be explained by the amount of the plasma loss. This blood volume was determined by the method of Meek and Gasser and compared with the reduction in blood volume as determined by the enumeration of the red blood-corpuscles. These red-cell counts or hemoglobin determinations are of value in indicating blood volume only when no absolute stasis occurs and no corpuscles are jammed in the capillaries. The blood volume was found to be decreased in all forms of experimental shock studied and after all grades of damage. The possible causes of reduction in the effective volume of blood are listed as follows:

(1) Decrease in the volume of blood as a result of transudation of plasma or transudation of plasma and jamming of the corpuscles in the capillaries and venules, or the latter combined with absolute stasis in some part of the vascular system, or finally hemorrhage into the tissue, especially into the lumen of the intestine.

(2) Dilatation of the capillaries and small veins with greatly decreased slowing of the circulation. This is always attended by some loss of plasma, but the latter may be relatively inconsiderable.

The transudation of plasma is greatly opposed by the injection of 4 c.c. per kilo of 20 per cent acacia before traumatization. The mechanism of action is believed to be due mainly to the antagonism

to filtration and the resulting increase in the osmotic pressure of the plasma colloids. Other possibilities are discussed.

W. H. EDDY.

GASSER, H. S., AND ERLANGER, J.: Studies in Secondary Traumatic Shock. V. Restoration of the Plasma Volume and the Alkali Reserve. VI. Statistical Study of the Treatment of Measured Trauma with Solutions of Gum Acacia and Crystalloids. VII. Note on the Action of Hypertonic Gum Acacia and Glucose after Hemorrhage. *American Journal of Physiology*, 1919, 1, 104, 119, 149.

These studies deal especially with the relation of measures to restore fluid volume in shock, with especial regard to the merits and defects of the liquids used. The summaries reveal the author's main conclusions:

*Summary of V.*—When glucose in 18 per cent solution is injected into the circulation of a normal animal the blood comes into osmotic equilibrium with the tissues within the first minute or two, the average maximum dilution amounts to but half of the theoretical maximum, and the blood regains its normal concentration within from five to forty-five minutes. When gum acacia in a concentrated solution is injected the average dilution of 41.7 per cent of the theoretical maximum is attained within from twenty-five to fifty minutes; the decline of the blood volume to normal requires from two and a half to six hours. When the concentrated acacia is immediately followed by the glucose the maximum dilution is quickly attained and is much greater than that resulting from the injection of either of the two substances alone. The dilution is well maintained. Comparable results are obtained in animals in shock when a strong solution of gum acacia is followed by a solution of  $\text{Na}_2\text{CO}_3$  that is osmotic to 18 per cent glucose. With such a combination of solutions given in appropriate amounts the blood volume, the blood-pressure and the reserve alkali of animals in shock can often be brought back to normal and held there for the usual duration of an experiment. Yet such animals, as well as shocked animals treated with other combinations of gum acacia and carbonate or bicarbonate, often died within twenty-four hours.

*Summary of VI.*—Of animals traumatized by holding the arterial

pressure down to 40 mm. Hg. for two hours and fifteen minutes by partially occluding the inferior vena cava, 48 per cent die within forty-eight hours. When treated with 6 per cent gum in 2 per cent sodium bicarbonate, 12 c.c. per kilo body weight, 45 per cent die within forty-eight hours. When treated with 25 per cent gum followed by 5 per cent sodium bicarbonate, 5 c.c. of each per kilo body weight, 56 per cent die within forty-eight hours. When treated with 25 per cent gum followed by 18 per cent glucose, 5 c.c. of each per kilo body weight, 45 per cent die within forty-eight hours. When treated with 25 per cent gum in 18 per cent glucose, 5 c.c. per kilo body weight, 24 per cent die within forty-eight hours. These results are taken to indicate that bicarbonate and the high viscosity of a gum solution are somewhat harmful, at least, in traumatized animals, that the harm of strong viscid gum can be avoided in part through the osmotic action of hypertonic glucose subsequently injected, but not by bicarbonate, and that when the hypertonic gum and the hypertonic glucose are given simultaneously and slowly so as to altogether avoid the period during which the high viscosity of the gum is hampering the circulation a maximal saving of life can be effected. The beneficial results are presumably due to the internal transfusion effected by the hypertonic solutions, to the maintenance of the increased blood volume by the colloidal, and possibly to the other properties of gum acacia, to the action of the hypertonic solution on the heart and blood-vessels, and to the specific action of glucose on nutrition in general and on that of the heart-muscle in particular. The author refers to the successful applications of these theories to man as reported in another paper.

*Summary of VII.*—The use of hypertonic gum-glucose solution is not contra-indicated in the treatment of shock, even when it is complicated by dangerous hemorrhage. The fact that the hypertonic gum-glucose solution does not prejudice the recovery of animals from the effects of a hemorrhage that is apt to result fatally furnishes another proof of the innocuousness of the solution.

W. H. EDDY.



## SECTION ON PEDIATRICS

GAMBLE, J. L., AND GOLDSCHMIDT, S.: A Study of Creatinuria in Infants. *The Journal of Biological Chemistry*, 1919, xl, 199-215.

I. *Relation of Creatinuria to Acidosis. The Elimination of Ingested Creatin and Creatinin* (p. 199).—In review the authors call attention to the following facts: Creatin never appears in the urine of a normal adult male in appreciable amounts. Normal women excrete creatin periodically, while children and infants regularly exhibit a creatinuria on normal diets. Hence the necessity of a study of creatin metabolism in both sexes and at different stages of growth for complete facts. Experiments are reported as follows: Variations in the acid-base intake have no effect upon the creatinuria of infants, and there is no satisfactory evidence that acidosis *per se* is a factor in the production of creatinuria. In regard to ingested creatin it was found that small amounts led to an increase in creatinuria in infants. In a single experiment, on a high protein diet, a practically complete elimination of ingested creatin was observed. There is evidence that the infant differs radically from the adult in its behavior toward ingested creatin, *i. e.*, the infant's tolerance is much less than that of the adult and the excretion more complete.

II. *Relation of Protein Intake to Urinary Creatin* (p. 215).—The study of the effect of variations in protein intake were carried out by modifications of a milk diet. The results show that the creatin excretion of infants bears a relation to the quantity of cow's milk fed and that the quantity of whey given is more directly related to the degree of creatinuria than is the total protein value of the food. Assuming that the preformed creatin in milk modifications

is in proportion to the quantity of whey present, the results suggest that the ingestion of creatin is probably a large factor in the creatinuria of infants fed on cow's milk.

W. H. EDDY.

BATCHELOR, M. D.: Aërobic Spore-bearing Bacteria in the Intestinal Tract of Children. *Journal of Bacteriology*, 1919, iv, No. 1, pp. 23-34.

The author has examined the dejecta of 50 children to see whether the changes in the intestinal flora are related to changes in the diet. She undertook as a first step to isolate and identify the aërobic spore-bearing bacteria found in the stools of 50 normal children, and noted the following distribution:

<i>Species</i>	<i>No. of Cases</i>
<i>Bacillus cereus</i> .....	32
<i>Bacillus albolactis</i> .....	17
<i>Bacillus pseudotellanus</i> .....	9
* <i>Bacillus mesentericus</i> .....	6
<i>Bacillus subtilis</i> .....	6
<i>Bacillus petasides</i> .....	2
<i>Bacillus vulgatus</i> .....	2

Besides these organisms five others were found, which were classified as new organisms: *Bacillus badius*, *Bacillus fusus*, *Bacillus tritus*, *Bacillus lautus*, *Bacillus flexus*. The rest of the paper deals with the cultural characteristics of the new organisms studied in detail.

F. HULTON-FRANKEL.

ARR, I. A.: Diabetes in Infancy and Childhood. *Endocrinology*, July-Sept., 1919, iii, No. 3, p. 273.

Experiments in diabetes fail to fully explain the clinical manifestations in man. Diabetes is infrequent in children as compared with its occurrence in adults, but we know that glycosuria occurs in children in a variety of conditions; in the newly born and in premature babies lactose is found in the urine and is alimentary in origin. Glycosuria also occurs in liver disorders, acute infections, organic brain diseases, and lues. True diabetes mellitus in children

usually assumes a severe progressive type characterized by a constant glycosuria, and when, under treatment, glycosuria disappears, the tendency is always toward a recurrence, and sugar appears in psychic disturbances, infections, and from other slight causes. Boys are most frequently affected during the first five years of life, and after this age both sexes are equally affected. Heredity undoubtedly exerts an influence, the disease in the mother usually being disastrous to the fetus.

Contributions on the pathological anatomy of the pancreas in diabetic children are few and not conclusive; nor is there found in the literature any relation between diabetes and diseases of the hypophysis.

The symptoms in children are identical with those in adults, and the disease may begin in a mild or a severe form, but the transition from the mild to the severe is more rapid than in adults, and the younger the individual the greater is the tendency to pass from the mild to the severe type.

L. C. JOHNSON.

GRIFFITH, J. P. C.: Acidosis in Children. *The Therapeutic Gazette*, July, 1919, xliii, No. 7, pp. 461-63.

The relative excess of acid in the blood, which constitutes the condition of acidosis, depends upon either over-production of acid bodies, or loss of alkali bases from the body, or upon failure of the kidneys and lungs to excrete the surplus acid. The disturbance of balance between alkalis and acids is responsible, not merely the presence of acid.

Acetonuria and acidosis must be distinguished, for acetone bodies are present in the urine of normal healthy children, without symptoms of acidosis being evident. The two conditions may be associated, or may occur entirely independently of each other. Acidosis can only be identified by the occurrence of specific symptoms, or by laboratory tests which reveal a relative excess of acid in the blood and tissues.

Children seem especially subject to acidosis, for reasons not altogether clear. Recurrent vomiting in childhood is often attributed to acidosis, because of the presence of acetone bodies, but the pos-



sibility must always be considered that the symptoms are due to starvation.

A prominent cause of acidosis, especially in infancy, is severe diarrhea of a non-inflammatory form, in which there is great loss of liquid from the intestines, as in cases of milk-poisoning," etc. It is not clear whether the condition is due to retention of acid phosphate, to the presence of lactic acid, to the reduction of the bases, or to some other cause. There is undoubtedly a great loss of alkali in the diarrhea discharge, which may be the principal factor. Acidosis sometimes occurs without discoverable cause. In some cases it is due to nephritis or to pneumonia.

There are few symptoms which may be considered positive evidence of acidosis. Among the early manifestations are restlessness, sleeplessness, and excitement, and later the development of somnolence, prostration, and coma. The only positive evidence, aside from laboratory tests, is hyperpnea, *i. e.*, "exaggerated inspiration and expiration, somewhat increased in rapidity and always present." This symptom may be slight or very severe, without there being discoverable involvement of the heart or lungs to account for it.

The prognosis of acidosis is always bad. Once the symptoms are advanced, they may be temporarily abated, but rarely cured.

Treatment should be *preventive*, but unfortunately little is known which will aid in anticipating acidosis. Conditions likely to produce excess of acids should be guarded against. Once the symptoms are apparent, the loss of alkali, as for instance in diarrheal stools, must be checked. Initial purgation in such cases is not only useless but dangerous as well. Alkalis should be administered freely, especially bicarbonate of soda in quantities sufficient to keep the urine alkaline. The salt may be given by mouth, bowel, or intravenously. For the latter method the solution must be especially prepared. It should not be boiled, as this reduces it to a carbonate, which is irritating.

In all cases of diarrhea, water must be given in large quantities to replace that lost.

# SECTION ON ROENTGENOLOGY AND ELECTRO- THERAPEUTICS

## FOREWORD

By I. SETH HIRSCH

The application of the roentgen-ray as a diagnostic agent in every field of medicine and surgery has made this method of diagnosis an indispensable one to the clinician. Though the art of roentgen diagnosis has not yet reached its highest and fullest development, it cannot be denied that it has made tremendous strides, conquering many fields, helping and benefiting the surgeon and physician in numerous ways, and that—as time goes on—it will undoubtedly increase its contribution to the art of diagnosis.

A vast literature, experimental, biological, diagnostic and therapeutic, has already accumulated on this subject, and it is obviously impossible for the practitioner of medicine and surgery to maintain unaided an intelligent, comprehensive, grasp of the rapid developments in this branch of diagnosis.

At the present time it is generally conceded that the information which may be gleaned from the *x-ray* examination is sometimes pathognomonic and characteristic but always valuable either in the negative or positive phase; when considered in association with the clinical data, it makes for great accuracy of diagnosis. It is this close relationship between the clinical and physical methods and the roentgen method which must be emphasized. It is reflected in the important indirect contribution which roentgenology has made to these older methods, by correcting, amplifying, and elaborating them. These methods, the old and the new, must and do supplement each other, and there is much truth in the statement that he is the better roentgenologist who knows his clinical medicine and he the better clinician who knows his roentgenology.

A hasty survey of some of the difficulties in the differential diagnosis will indicate the gaps, unfortunately not a few, which roent-

genology fills in our diagnostic knowledge. In the abdominal cavity the contribution has been well-nigh revolutionary in its effect upon physiological and diagnostic problems.

"It is perhaps no exaggeration to say that in no field of internal medicine has Roentgen's discovery accomplished so much as in abdominal diagnosis. The contour, position, and motility of the stomach and intestines in the living were not correctly known until the *x*-ray portrayed them on the screen. The new facts not only corrected previous findings, but also led to physiological discoveries of unusual value. Among these were the following: the importance of the tonus of the gastric muscle; the interesting play between the gastric peristalsis and the pyloric ring; the help which the antrum pylorus lends to the propelling force of the pyloric vestibule, churning and expelling the food within well-defined rules; the importance of the pylorus in correlating gastric and intestinal secretory processes; the difference in the rate of discharge of different food particles; the segmentation and pendulum movements and the peristaltic rush of the small intestines; the antiperistalsis of the ascending colon and its relation to the ileocolic sphincter; the sweeping peristaltic waves of the colon, so different from the peristalsis of the small intestines; the formulation of the so-called law of the intestines—the stimulated point leading to contraction above and relaxation below."—(Kast).

Its value in the differential diagnosis in diseases of the abdomen is so obvious as to render any elaboration unnecessary. The demonstration of gastric and duodenal ulcers, the accurate localization of abdominal tumors, and the determination of intestinal adhesions, have become matters of routine, while with improvement in technic the diagnosis of gall-stones is daily becoming more accurate. In the differential diagnosis of diseases of the chest the contribution of the roentgen examination has been of exceeding value. A moment's consideration, let us say, of the pulmonohepatic region—a region where lie many diagnostic pitfalls—will emphasize this. The close anatomic relationship of the viscera in this locality, the similarity of the subjective symptoms due to disease, the difficulty of isolating the objective signs, and the frequency of the concomitant involvement of several organs make this region in particular one wherein the utilization of every clinical and diagnostic method is essential for the proper interpretation of the pathological manifestations. The conditions



which are likely to be confused with each other may be enumerated as follows: consolidation of the right base with occlusion of the bronchi, pleuritic effusion, free or encysted; abscess in the lower lobe; bronchiectasis; pleural fibrosis with atelectasis; hydropneumothorax; pericardial effusion; diaphragmatic pleurisy; subdiaphragmatic abscess; abscess of the liver; diaphragmatic hernia-eventration; diaphragmatic paralysis.

On no mere theroretical or fantastic basis are the above conditions enumerated. The subjective symptoms of pain, dyspnea, cyanosis, cough, fever, and chills, though they frequently serve to indicate involvement of this or that particular organ, do not, however, always absolutely clear the diagnosis. Indeed, it may be said that the subjective symptoms, common as they are to most of the pulmonary diseases, have little diagnostic value. For instance, there may be mentioned the similarity as to site, duration, and character of the pain of diaphragmatic pleurisy, basal pneumonia, and subdiaphragmatic abscess, while the absence of pain in pleural effusion and liver abscess and the presence in both these conditions of chills, temperature, and dyspnea is generally appreciated. Occurring either as a complication of a pulmonary disease or otherwise, pericarditis with effusion does not always present a subjective picture which would serve to identify it. In fact, it is the complications of the pulmonary diseases which show subjectively only as an increase in the intensity of the symptoms which tax our diagnostic efforts. Nor can the severity of subjective symptoms always be accounted for by a proportionate variety and number of physical signs. A patient with persistent cough and foul expectoration, with the general effects of chronic pulmonary inflammation, may show few and unimpressive physical signs.

The results of the physical examination may not always clearly determine the nature of the lesion. Pneumonia of the right base with plugging of the bronchi might be easily differentiated from pleural effusion, were it possible always to determine the degree of displacement of the heart. However, even with fairly extensive right-sided effusion, this cannot always be done. The diagnosis of post-pneumonic conditions presents many problems so familiar as not to require elucidation, but it is sufficient to say that their immediate solution is not always possible by clinical means. Much watching,

waiting, and persistent scrutiny are necessary. The differential diagnosis between pleural effusion and subdiaphragmatic or liver abscess is difficult, as the physical signs may be identical. Even the insertion of a needle and the withdrawal of pus does not tell all, since it is not easy to decide whether the pus comes from above or below the diaphragm. The difficulty in the differentiation of emphysema from a partial pneumothorax is well known, as is the problem of determining the extent and size or even the presence of an effusion associated with pneumothorax. Variable dullness with diminished respiratory murmur and marked costovertebral tenderness may be the only physical signs of a perinephritis or of a liver abscess.

Again, an enlargement or displacement of the right heart may be indistinguishable from a patch of consolidation in the lower anterior portion of the right base, through which the heart-sounds may be transmitted with great clarity, in marked contrast to their feebleness over the left side, because of a possible emphysema. A pericarditis with effusion may be mistaken for dilatation of the heart. Consider eventration: Its general clinical picture, with more or less sudden onset, and respiratory crisis, suggests the advent of pleurisy, and the physical findings of tympany, respiratory immobility, and cardiac displacement will suggest hydropneumothorax; yet the *x-ray* appearance is absolutely characteristic and pathognomonic.

A definite train of gastric and intestinal symptoms is associated with congenital smallness of the heart (Laennec, Virchow, Muller, His, Wenkebach, Adler). Roentgenologically this condition is simply and graphically demonstrable. The diagnosis of aneurysm by the older physical methods, responsible for much clinical humility (Osler), is far surpassed in accuracy and definiteness by the roentgen method. The diagnosis of incipient tuberculosis by the ordinary physical methods is difficult, because of the scarcity of signs, the normal variations in the percussion note and respiratory murmur at the apical area, and the difficulty of differentiating between the intrapulmonic and the adventitious sounds.

Besides this the initial processes of pulmonary tuberculosis are, as proved by Rieder, Ghon, and others, not in the apices, but in the central portion of the lung in or about the hilum and its lymph-nodes, and these changes are not readily revealed by physical signs. By the roentgen method, however, the variety, shape, size, and manner

of extension of the early and late changes are made manifest before physical signs disclose them. Although it is conceded that some of the earliest changes are not pathognomonic of tuberculosis individually or collectively, still, when studied in conjunction with carefully analyzed data, they gain in importance as evidence, and the later changes are usually proved radiographically to be more extensive than the physical signs would indicate. The signs of diffuse miliary infiltration may be only a slight roughening of the respiratory murmur. Cavitation may exist without audible manifestations. Tumors of the lung, metastatic or primary, give but few signs and symptoms early in their existence. Extensive bronchiectasis may exist with few signs. The operative treatment to which this latter disease is being subjected necessitates the determination of the number, form, size, and location of the bronchial dilatations. This cannot be done clinically, particularly where multiple foci exist.

Patches of consolidation in the central portion of the lung are surely overlooked with great frequency, if, according to Wintrich, a patch of consolidation must attain the size of 2 x 5 cm. and be superficially situated in order to produce sufficient percussion dullness. Yet the smallest of such foci may be isolated by the roentgen method, and it behooves the clinician to utilize the data furnished by the *x*-ray examination, data which are accurate records by physical agencies, requiring only proper interpretation for their translation into valuable knowledge. The tendency to discredit or ignore what workers in this field have accumulated by laborious research and painstaking effort is deplorable. It is deplorable, too, that the knowledge of the interpretation of the fluoroscopic and radiographic picture is not more general, and it is surely as incumbent upon the medical man to acquaint himself with the roentgenological appearance of the structures, as it is for him to recognize the appearance of a granular cast or of the tubercle bacillus. Not that the last word in interpretation has been said, but sufficient has been established on well-proved grounds to render the method indispensable to the clinician. It is conceded that in some points the roentgen diagnosis has not as yet attained incontestable form, and that the method is not infallible; yet these are not excuses for its neglect. Who will contend that the last word has been said on auscultation or percussion? Surely, as has been pointed out, these time-worn and time-honored methods have



been studied by the best medical minds for a hundred years, and yet even to-day a voluminous literature testifies amply to the fact of their incompleteness and fallibility.

Time was when the practice of this diagnostic art was entirely in the hands of the roentgen specialist. But, through the labors of these workers, the methods and the principles have been so elucidated that the torch may now be passed on to the internist for the illumination of the devious and dark paths of clinical diagnosis.

The time has now arrived when those competent by virtue of training and experience to teach the principles and practice of this diagnostic art should do so, promulgating widely the method by which this agent may be utilized. It is through the agency of such a supplement as this that it is proposed to spread the gospel of the roentgen method to those of the profession who desire to keep abreast of the advances in this line of medical endeavor.

It is, however, essential, that the medical mind firmly grasp the fact that the fundamental basis of the entire art of roentgenological diagnosis is gross pathology. It is nothing more complex than this, but simple as the concept is, it does not appear to be generally appreciated.

For when all is said and done the roentgenologist is a pathologist, whose instruments are not the microtome and microscope but the *x*-ray tube and sensitive screen or plate, whose material is not specimens but human beings, whose readings are in terms of tissue densities, and not of cellular arrangements, and whose results are barren if not interpreted in the light of clinical medicine.

Given that interpretation, his labor becomes a contribution to the study of the particular case, which may vary in its value, significance, and importance, depending upon contributions from other sources, attained by other methods, interpreted by other standards.

Not only is it important that the roentgenologist appreciate this, but it is vastly more important that the clinician grasp it.

Therefore, the object of this department will be to present to our readers not only all contributions which deal solely with the roentgenological aspect of disease, but also those in which the *x*-ray examination played an important rôle in the clinical study of the case, and such pathological contributions as elucidate roentgenological interpretation.



## ABSTRACTS

WESSLER, H.: Lung Abscess and Bronchiectasis. A Clinical and Roentgenological Study of One Hundred Cases. *American Journal of Roentgenology*, April, 1919, vi, No. 4, p. 161.

Wessler, in a well-written paper, studies the sequence of events in cases of postoperative lung abscess. These most commonly follow tonsillectomy, and only when the patient is fully under the influence of ether. There can be little doubt that these abscesses result with relative frequency from the aspiration of the infected plugs in the tonsillar crypts which are squeezed out when the tonsil is grasped in the forceps. The lodgment of such a plug in a bronchus gives rise to a pneumonia varying in extent from a small patch up to a whole lobe, with the usual accompanying symptoms. At the point of lodgment of this septic plug, the anaërobic organisms set up a destructive inflammation of the bronchus, with the formation of a gangrenous bronchiectatic cavity of varying size. Such a cavity usually lies embedded in the infiltrated lung, and by its presence and the putrid secretions which it engenders maintains a chronic irritation of the lung about it. If the necrotic walls of the cavity slough out and are expectorated, the anaërobic infection dies out. It no longer exerts its irritant effects on the lung; the pneumonia subsides, the lung once more becomes air-containing, and as it expands automatically obliterates the cavity.

Such a desired result occurs only in cases of short standing. A persisting irritation soon leads to fibrosis, which brings in its train rigid membranous cavity walls that will not collapse. Such an abscess cavity is no longer capable of spontaneous healing. Sooner or later, the overflow from this cavity will infect neighboring or distant healthy lung tissue and the disease will take on renewed activity.

Another type is a progressive round-cell infiltration, fibrosis; the terminal bronchioles are strangled and secondary bronchiectatic cavities develop. Usually these secondary cavities are much smaller

and are not visible on the plate. In fact, in the great majority of the cases only one fairly large cavity is visible on the roentgen plate; on the operating table or at autopsy additional macroscopic cavities are usually found, and only microscopic dilatations of the bronchi. Such cases can only be cured surgically by eradicating the whole diseased lobe, by a lobectomy; the cases of solitary abscess without infiltration may be effectively treated by incision and drainage.

The roentgen-ray affords a convenient and exact method of following the evolution of suppurative lung conditions. In cases of remissions in which the signs and symptoms may be absent, the roentgen examination will always show evidence of disease. More commonly there may be only a small area of pneumonic infiltration which has persisted after an apparent cure. Ill-defined, and inaccessible to ordinary methods of examination, such a focus of disease will flare up under ill-understood unfavorable conditions and reproduce a former extensive involvement of the lung. Before a cure of a lung abscess may be pronounced, therefore, not only must the clinical symptoms and signs have subsided, but all roentgen evidence of disease must have disappeared.

The frequent exacerbations which mark the course of many lung abscesses owe their origin to an extension of existing foci of disease. Conditions for their occurrence are most favorable when there exists a large cavity full of secretion communicating with a bronchus. The spilling over of the contents of this cavity, or their expulsion in the act of coughing, will inundate a near or remote portion of the bronchial tree and thus at a stroke inaugurate a widespread disease.

A second large group of suppurative lung conditions is that which follows pneumonia or influenza, or is a sequel of an attack of bronchitis. In a general way it is possible to distinguish two types of abscess conditions in these cases. In the one the sequence of events after pneumonia is very similar to that encountered in aspiration abscesses. In a second, larger group of cases resulting from pneumonia, the patients are usually seen some months after the onset of their illness. They do not appear to become gangrenous until later, and therefore many of them do not exhibit a large cavity. These cases are very insidious and go on to a progressive fibrosis with the development of numerous bronchiectatic cavities. The roentgen observation of such cases is very instructive because the persistence of fever and cough and the invariable hemoptysis lead to a strong

suspicion of tuberculosis or of an encapsulated pleural effusion. On the roentgen plate one may follow the persisting pneumonic infiltration from its early stages for a period of months, noting a gradual increase in its density, due to fibrosis. Here cavities are rarely visible, as they consist in small dilatations of the bronchi which are indistinguishable in the general infiltration. If the bronchi becomes sufficiently dilated and thin-walled the roentgen plate may reveal a honeycombed appearance of the lung. There may develop single or multiple abscess cavities. The cases just described are conveniently grouped as chronic non-tuberculous lung infections in contradistinction to cases of tuberculosis, which they superficially resemble. Although they are thus frequently diagnosed and are consequently found in sanatoria, it is an easy matter, by means of their characteristic roentgen appearance, to assign them to their proper place.

The author then presents a résumé and analysis of 100 cases of suppurative lung disease and some observations suggested by a study of them.

I. S. HIRSCH.

STEWART, W. H., AND STEIN, A.: Roentgen Ray Study of the Abdominal Organs Following Oxygen Inflation of the Peritoneal Cavity. *The American Journal of Roentgenology*, November, 1919, iv, No. 11.

The authors give a history of the procedure which was first used in 1910 by Jacobaeus in Stockholm.

In January, 1912, Weber, working in the Private Institution for Roentgen Diagnosis of Drs. Eugene Weber and V. von Bergman, of Kies, conceived the idea, based on the roentgen examination of a bladder filled with oxygen showing good details of a hypertrophied prostate, that the introduction of sterile inactive oxygen or air into the abdominal cavity might help to render visible a number of organs, tumors, and abdominal areas which heretofore had been more or less inaccessible to the roentgen-ray examination. His roentgenograms showed that the following viscera and areas may be rendered visible by means of gas inflation of the abdomen: the liver and spleen as a whole, including the region of the gall-bladder; coils of the large and small intestines, without bismuth filling; the pyloric end of the stomach; the wall of the stomach and large intestines, with gas contents; the bladder filled with urine; parts of the mesentery; the sub-

phrenic space, not readily accessible to diagnosis; and many abdominal tumors. He emphasized the far-reaching importance of air or oxygen inflation of the abdominal cavity for experimental and diagnostic roentgenology, and laid stress on the value of the method for obtaining good roentgenograms of the liver and biliary region, as well as for the roentgenographic representations of tumor and inflammatory swellings.

The latest contribution to this subject is made by A. Schmidt, who, in February, 1919, published an article confirming the opinion of former authors as to the value of this method.

The authors have examined altogether 37 cases, the results of which investigations have been somewhat startling.

The technic required for the inflation is extremely simple. After the intestinal tract has been thoroughly cleansed and the bladder emptied, the patient is put upon his back. As a rule a point is selected on the anterior abdominal wall about 1 inch to the right or left and 2 inches below the umbilicus. The skin is thoroughly scrubbed, and sterilized with tincture of iodine. If adhesions are known to be present or an abdominal scar is visible, it is well to avoid this area. After the skin has been anesthetized with an ethyl chlorid spray, an ordinary lumbar puncture needle is passed obliquely downward until it reaches the fascia; the needle is then pushed gently through the fascia muscle and peritoneum into the abdominal cavity. The plug is withdrawn and the needle connected with a rubber tube, the other end of this tube having been previously attached to the outlet of an ordinary oxygen tank. Oxygen is now allowed to flow gently into the peritoneal cavity. Sufficient gas should be used to render the abdomen dome-shaped in appearance; as a rule it requires about four liters, the quantity depending largely upon the amount of relaxation of the abdominal walls. In case the pressure from the tank should be too high, the rubber tube will jump from the needle, as the caliber of the needle is very small.

The tube is then disconnected, the needle quickly withdrawn, and the site of the puncture covered with a small piece of adhesive plaster, the entire procedure having been conducted under modern aseptic precautions.

The patient frequently complains of a sense of fullness from the distention, and may have some pain in the shoulder, especially the right, probably caused by pressure on the diaphragm.



The roentgen examination should be made as soon as possible after the inflation, as the patient becomes accustomed to the distention. If a longer interval than an hour is allowed, emphysema is liable to occur from leakage of oxygen through the peritoneal opening into the outlying structures. Such an event interferes with obtaining clear details of the abdominal organs.

The oxygen is gradually absorbed by the abdominal tissues, disappearing almost completely in from twenty-four to forty-eight hours.

The cardinal point to be constantly borne in mind in making the roentgenographic examination is that the particular organ which is investigated must be placed in the highest plane possible in order that it may be completely surrounded by the gas, and that the intestines, which are freely movable in the presence of oxygen, be allowed to drop away, thus avoiding conflicting shadows. This applies particularly to the kidneys and urine appendages.

To obtain the best detail of the diaphragm and liver with the gall-bladder region, the spleen and the glandular enlargements, the patient is instructed to lie on the abdomen with the tube above, and stereoscopic roentgenograms are made from behind forward.

Further liver and spleen details with excellent kidney outline are obtained by having the patient lie on one side. If the left kidney and spleen are being investigated, the patient lies on the right side, the left being uppermost, the tube is placed in front and the plate properly supported with sand bags behind. If details of the liver and right kidney are sought, the patient lies on the left side, other requirements being the same.

There are two positions for obtaining satisfactory shadows of the uterus and appendages: one is the right and left exaggerated lateral Trendelenburg, obtained by placing the patient on the side and elevating the hips on a support about 6 inches high, with the thighs and legs slightly flexed and the shoulders and head low, resting on the table, the tube and plate in a similar relation to the patient as in the straight lateral. The other position, which seems to bring out the best detail of the pelvic organs, is obtained by the use of a canvas top table, one end of which has been elevated about 15 degrees. The patient lies on the abdomen, the head toward the lowest portion of the table, the plate is placed on the back, properly held in position by sand bags, the tube is beneath, the anode being centered on the promontory of the sacrum. By this method the intestines drop out

of the pelvis and are replaced by the oxygen, which surrounds the fixed organs.

Intraperitoneal adhesions are detected by placing the patient on the back, the plate on one side and the tube on the other.

The two factors which must be considered in the use of this method are the danger of infection and the risk of puncturing the intestines. The first can be overcome by the ordinary precautions; regarding the second objection the authors feel that with care there is absolutely no danger of puncturing the intestine.

I. S. HIRSCH.

NAKAHARA, W., AND MURPHY, J. B.: The Effect of Small Doses of X-Rays of Low Penetration on the Lymphoid Tissue of Mice. *The Journal of Experimental Medicine*, Jan. 1, 1920, xxxi, No. 1, p. 13.

The destructive effect of x-rays on the lymphoid tissues was early noted in the study of the biologic effect of this agent. The stimulating action on the circulating lymphocytes was first observed in the author's laboratory and was applied experimentally in the study of x-ray effects on spontaneous tumors of mice. The Coolidge tube, which permitted the standardization of dosage, was used.

Experiments were made upon rabbits and mice. The histological study and blood-counts in rabbits confirmed the general nature of the stimulation by showing a marked degree of increase in the number of mitotic figures in the germinal centers of the lymphoid organs of these animals. In the case of mice, similar results were observed.

A dose of x-ray governed by the following factors induced a stimulation of the lymphoid tissue in mice: spark gap  $\frac{7}{8}$  inch, milliamperage 25, distance 8 inches, time of exposure 10 minutes. Within four days after this dose an abnormally large number of mitotic figures appeared in the lymphoid tissue of the spleen and lymph-glands, indicating an acceleration of the proliferative activity of the tissue.

H. M. FEINBLATT.

KIMURA, NORIYOSHI: The Effects of X-Ray Irradiation on Living Carcinoma and Sarcoma Cells in Tissue Cultures *in vitro*. *Journal of Cancer Research*, April, 1919, iv, 95.

The author investigated the effect of *x*-ray irradiation of increasing intensity upon the vitality of the cells of transplantable mouse carcinoma (Gaylord) and sarcoma (Ehrlich). His results were:

(1) Both tumors, in "tissue culture," grew as well in guinea pig plasma to which had been added mouse serum diluted with Ringer's solution as in mouse plasma itself.

(2) The growths of the two tumors *in vitro* showed respectively the characteristics of the original tissues; *i. e.*, the sarcoma culture produced a radial outgrowth, spreading widely in the plasma medium, while the carcinoma cells grew continuously into the medium, as cell groups, from the edges of the fragments.

(3) The outwandering of the cells into the medium was not prevented by any of the four degrees of irradiation employed, but with both tumors mitotic cell division was lessened in tissue culture after the third degree, and absent after the strongest degree of *x*-ray treatment.

(4) The growing power of sarcoma (in animal inoculation) appeared to be somewhat stimulated by exposure to the second degree of irradiation, but it was lessened by the third degree and abolished by the strongest degree of treatment.

(5) The process of oxidation in the tissues in the tissue cultures of both tumors was stimulated by the second degree and retarded by the fourth degree of exposure to *x*-ray.

A. F. COCA.

McCLURE, G. W., AND McCARTY, E. D.: Roentgenographic Studies in Gout. *Archives of Internal Medicine*, Nov. 15, 1919, xxiv, No. 5, p. 563.

In the cases of gout studied the authors found:

(1) Focal areas of decreased density, which may be the only changes. These changes are usually most pronounced in the heads of the metatarsal or metacarpal bones.

(2) Very slight lipping at the margins of the articular surfaces of the bones entering into the first metatarsophalangeal joint.

(3) A variable degree of atrophy of all the bones of the affected member, or of the bones of an involved joint only.

(4) Narrowing of certain joint spaces, with marked proliferative and atrophic changes.

The focal areas of decreased density have been supposed to be pathognomonic of gout, but the authors have found them in from 10 to 12 per cent of non-gouty arthritides.

T. HOWARD.

GIBSON, J. D.: Roentgenotherapy. Gleanings from the Field of Tuberculosis. *American Journal of Electrotherapy and Radiology*, March, 1919, xxxvii, No. 3, pp. 74-76.

The author advises the use of all kinds of light, sunlight, violet rays, actinic, and *x*-ray, especially the latter. The object is: (1) to increase the activity of the interchanging cellular ions and electrons, and thus to improve the metabolism of the cells, (2) by the stimulation of the direct rays to bring about hyperemia and leukocytosis in the tissue-cells. The large mononuclear leukocytes are most important in the treatment of pulmonary tuberculosis. G. Webb, of Colorado Springs has found the number increased in all improved, healing and arrested cases.

In the cases treated by the author with *x*-rays in addition to diet, hygiene and climatic and medicinal therapy, recovery resulted. He gives tables showing the number of polynuclears, large lymphocytes, large mononuclear basophils, etc., found in the blood of these patients, and control tables for patients not treated with *x*-rays. A comparison of the tables shows a great increase in the number of large mononuclears after *x*-ray treatment.



# SECTION ON NEUROLOGY AND PSYCHIATRY

## FOREWORD

By SETH ELY JELLIFFE, M.D., PH.D.

At the outset of any new undertaking an explicit setting forth of the objectives sought is rarely out of place. The editor of this department therefore takes this opportunity of sketching the platform which he has in mind, and of outlining the general policy which will be pursued in presenting to the readers of this magazine the abstract material to be issued monthly.

The published results of the work being done in the fields of neurology and psychiatry, using these terms in their broadest sense, as synonymous with the total activities of the nervous system—with certain limitations which may be included under the term “sociological”—these results are so vast that only the ignoramus, unacquainted with the immensity of the material, would claim to cover it entirely. We shall not therefore say that these abstracts will cover the fields of neurology and psychiatry in their entirety. If this magazine were given over completely to the printing of titles, as is for instance that excellent monument of American medical science, the *Index Medicus*, it could just about cite the authors' names and the titles of the papers which are directly concerned in this, the broadest by far of all fields in human and inhuman activities.

From this mass of material, however, it is possible from time to time to crystallize into solid formulations the work of many investigators, and to take such formulations into the everyday working world of the practitioner of medicine, and through them to provide him with the means of broadening his understanding of disease processes, thereby rendering him more able to make a living because of his increased usefulness to his fellow man.

It is largely with this goal in mind—*increased usefulness* in

matters large and small—that the world's literature of neurology and psychiatry will be culled in this abstract department.

It was said of Huxley that in matters of zoölogical science he had the great gift of bringing the best fruits of specialized research within the ken and grasp of the average layman. He popularized science in the highest and best of senses. By some such point of view the efforts here expressed will be directed—at least such will be the attempt.

The platform that shall serve as a foundation of these will assume that man, differing from other living things only in complexity, is a machine for the capture, transformation, and release of energy. This energy constitutes his environment, cosmic as well as terrestrial. By processes which the historical method of research has more or less agreed to call "evolution," the human machine has developed groups of structures which anatomy terms organs. Our assumption is that these organs have grown to be what they are after approximately one hundred million years of experience in handling this energy. Any machine, therefore, that has been in the process of perfecting itself for such a length of time is not the simple little Jack-in-the-box that a naïve simplicity would picture it to be. Notwithstanding this bewildering complexity, however, man makes valiant, even if at times amusing efforts, at understanding how he works. He must do so, or sink into the morass of pessimism, agnosticism and despair.

The simple cellular organism captures, transforms, and releases energy chiefly through physicochemical processes. It becomes chemically and physically integrated, and the conclusions as to the properties of protoplasm represent our best hypotheses concerning this integration. With multiplicity of cells specialization of function began to be, and organs arose, which, to use Maudsley's<sup>1</sup> phrase, structuralized the functions. Biological science assumes that, as needs arose in the furtherance of the capture, transformation and release of energy, this integration built up a series of structures, which we call the nervous system, calculated to carry on the energy-utilizing formula more advantageously, at higher and higher levels. Should one prefer a more mechanical term, later and later models of the animal machine, the greatest new inventions or improvements,

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<sup>1</sup>MAUDSLEY, H.: From Organic to Human. The Macmillan Co., 1917.

were constantly being patented, as it were, in the office of the nervous system.

We have already stated this in this fashion:<sup>1</sup>

“The diseases of the nervous system are no longer compassed by a description of the gross lesions of the brain, spinal cord, cranial and peripheral nerves. The more limited symptomatology of disorders of these structures, which in this work has been called sensorimotor neurology, has been expanded in two directions—in one by the increase in our knowledge of the historically oldest portion of the nervous system, namely the sympathetic and autonomic (vegetative) nervous system, and in the other by the increase in our knowledge of the mechanisms that operate at the psychic or mental levels.

“The vegetative nervous system is in close functional relationship with the endocrinous glands, and, although some of the endocrinopathies may ultimately turn out not to be exclusively nervous affections, still these organs of internal secretion are so closely related from all points of view, embryological, anatomical, physiological, pathological, and pharmacodynamic, with the vegetative nervous system that their disordered functions must needs be considered in a work dealing with the diseases of the nervous system. The symptomatology of this region constitutes the borderland of neurology and internal medicine.

“At the highest level stand the mental mechanisms in which action receives a symbolic representation. Here the nervous system is also the medium through which that form of physiological or pathological activity called conduct is brought about. These mechanisms, while operating consciously, largely through the sensorimotor channels of adjustment, are also intimately related to the vegetative levels where, through the emotions, they act unconsciously.

“The authors have kept in mind the concept of the individual as a biological unit tending by development and conduct toward certain broadly defined goals, and have considered the nervous system as only a part of that larger whole. The part, however, partakes of the unity of the whole, and, as far as possible, the attempt has been made to arrange the diseases of the nervous system in accord with this evolutionary concept.

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<sup>1</sup>JELLIFFE AND WHITE: *Diseases of the Nervous System*. 1st Edition, 1915.

"For practical purposes, and for the reasons stated, the work has therefore been divided into three parts, dealing respectively with the vegetative, the sensorimotor, and the psychic levels, the reactions in all of which come to pass through the medium of the nervous system.

"Man is not only a metabolic apparatus, accurately adjusted to a marvelous efficiency through the intricacies of the vegetative neurological mechanisms, nor do his sensorimotor functions make him solely a feeling, moving animal, seeking pleasure and avoiding pain, conquering time and space by the enhancement of his sensory possibilities and the magnification of his motor powers; nor yet is he exclusively a psychical machine, which by means of a masterly symbolic handling of the vast horde of realities about him has given him almost unlimited powers. He is all three, and a neurology of today that fails to interpret nervous disturbances in terms of all three of these levels takes too narrow a view of the function of the master spirit in evolution—the nervous system."

It is by means of and through this master spirit in evolution, the nervous system, that the organism as a whole works. In order to understand, even approximately, how the organism as a whole works, it is essential that all should have some elemental idea as to the structures that really permit the functions to go on, for function and structure, after all is said, are only two aspects of the same thing.

In the first place our platform assumes that the elemental idea of the nervous system is one built up on a plan of the reflex arc. The generalized property of protoplasmic irritability was the starting point. Then, as center and periphery separated, stimulus point grew away from reacting point. Parker<sup>1</sup> has very brilliantly sketched the gradual development of the nervous reflex out of the primitive muscle-gland cell, until the final elemental formula has come to be expressed as: (1) receptor or stimulus-receiving part of the reflex arc, (2) connector or nerve-fiber, which chains up the different arcs, or makes connections with the muscle or glandular cells, and (3) effector part of the arc. This combines with the energy formula already spoken of. The receptors are those cellular modifications which react to specific types of stimuli—energy sources—and thus capture the

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<sup>1</sup>PARKER, G. H.: *The Elementary Nervous System*. J. B. Lippincott & Co., 1918.



energy. The connectors are those nerve-fibers which, making a dense network throughout the entire body, transmit these stimuli, and transform and distribute the energy according to local or organ needs. Finally the effectors deliver the energy over into different forms of behavior—glandular action, heat-production, cellular building, speech activities, muscle activity, social action, etc., etc.

The neuron hypothesis assumes an elementary nature for the various parts of these reflex arcs in which each integer in a chain is separated from its neighbor at a juncture, or sort of spark gap—the synapse. Thus the simplest type of reflex arc would be stated in these terms: Receptor organ, usually a free nerve terminal or a modified epithelial cell with a nerve-fiber synapse—connector fiber—synapse—effector organ. In the complex nerve pattern a stimulus may pass over a score or more connector synapses before the final effector discharge. Here the entire problem of neuro-anatomy is involved. This is told simply and ably, for the beginner as well as for the specialist, in Herrick's<sup>1</sup> recent little volume.

A type of kindergarten physiology has unfortunately been perpetuated in even some of the better texts to which the student of medicine has been introduced. Five senses are spoken of. This characterization is too infantile for medical needs, and in order to understand the platform here being built up it must be realized that there are thus far, well described, some twenty or more types of receptors, or sense organs, capable of reacting to the specific energy stimuli from which the human being really derives the energy that runs him. Man is no more of a perpetual motion machine than is an automobile. He makes no energy—he simply transforms what he gets from the cosmic and terrestrial sources, and his receptors get it for him.

We cannot here enumerate all of the receptor structures; it will be a part of our program to report to our readers all of the newer discoveries of receptors, but, for purposes of illustration, we would remind the reader that the skin has separate receptors for touch, pain, heat and cold. The pigment in the Malpighian layers of the skin contains receptors for light stimuli, which are of different wave length from those caught by the receptors of the retina. There are receptors

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<sup>1</sup>HERRICK, C. J.: *An Introduction to Neurology*. 2nd Ed. W. B. Saunders & Co., 1919.

in tendon and muscle which are constantly at work with gravity stimuli, and receptors reacting to the weight of the atmosphere. There are a host of chemical stimuli receptors: those of the olfactory area in the nose, the gustatory papillae in the mouth, and a series of specific types of receptors—as yet little known—for differentiating between chemical substances, twenty-six of which are known to be integrated in the human machine, and part of the energy of which these receptors are capable of capturing. There are chemical receptors which sort out the carbon dioxid and oxygen densities in the blood and cellular constituents, and start the respiratory arcs to functioning. There are receptors in the wall of the bladder which register pressure stimuli and start the bladder contractions; there are also intestinal pressure receptors. There are special receptors located in the pancreas, the spleen, the liver, the thyroid, the pituitary, the pineal, that react to the specific substances which have been called enzymes, hormones, etc.

Not to unduly lengthen this plank of the platform, it can be seen that there are literally millions of specialized types of protoplasm which react to a group of comparatively limited stimuli, some of which come from far away as the sun, and originate in the motions of our solar system. Others are bound up in the physics of gravity, of barometric pressure, of thermal qualities, while others react at close range to touch and sound and smell; still others, located within the body itself, are acted upon by the chemical substances which are taken in as food, or air, in simple or compounded forms.

One entire group of stimuli-receiving organs, their connectors and their effectors, forming an intricate network throughout the entire body, may all be grouped under one system, to which the name of the *vegetative*, or *visceral nervous system* may be applied. In the older nomenclatures this was termed the “sympathetic nervous system” and by some physiologists the “autonomic system.” We prefer the term *vegetative* or *visceral nervous system*, since the chief function of this system, as a whole, is to maintain the metabolism or the upkeep of the machine as a machine. It is constantly in service, night and day; it has automatically built itself up and has performed its work for millions of years—namely the physiological upkeep of the machine as a whole. In lower forms of life it is the only type of nervous system, and from the evolutionary point of view it may be said to be the most primitive, fundamental, nervous system—sufficient unto itself.

In a gross and simplified metaphorical way it may be compared to an automobile whose engine is running but which is standing still, waiting for the driver to put the machine to specific uses. When the driver thrusts in the clutch, and takes hold of the steering gear, this new type of service is, in the same gross metaphorical way, to be compared to the function of the nervous system to which anatomists have given the name *sensorimotor system*—which has grown up as an essential part of the animal machine ever since the vertebrate ancestor commenced to integrate the nervous structures into what ultimately became a brain and spinal cord. The study of the latter in man and his immediate ancestors has been far more extensively investigated than that of the comparatively simpler yet intrinsically equally vital part of the nervous machinery, the *vegetative nervous system*.

In a sense it is unfortunate for the understanding of the human machine that the study of the steering gear and of the transmission has preceded the study of the motor, for the generalizations of the later developments of the machine have been applied to the simpler forms of the machinery, and have, in certain definite ways, led to a necessary misapplication of principles, resulting in great confusion. All of this, as a part of the platform here sketched, must be corrected, and a new start must be made in reshaping the definitions which have been current in many of the studies made upon the nervous system. This newer attitude at once goes to the root of the interpretation of the physiological processes of the organs which make up the motor of the human machine, and much physiology must be rewritten in terms of visceral neurology. Evidences for the need of the change are everywhere present in all current physiological discussions. Similarly, the need for a dynamic pathology in terms of the disturbance in integration of the organs of the body, from the visceral-neurological point of view, is making itself felt more and more, and a purely static and descriptive physiology and pathology is given way to the necessity for understanding functional processes as modified and controlled through the vegetative nervous system.

It will be a part of our program to collect here this newer work on the action of the nervous system upon the functions of the various viscera. Heretofore the explanations of bone formation, of bile production, of kidney secretion, of blood-cell manufacture, of digestive



functions, etc., etc., have either been purely morphological, or chemical and descriptive. We have been told what the osteoblasts look like, and what the developing Haversian system looks like in its various stages. We learn that this blood-cell comes from this part of the bone-marrow and this one from that. But nowhere is there any intimation of a dynamic series of forces which, by greater or lessened action through this or that part of a reflex arc, is really the determining process in producing a hyperglycemia, or an increase or diminution of hydrochloric acid in the gastric juice, or a change in the blood picture, or some other physiological modification.

Similarly in the field of pathology, the most fundamental of all integrative processes, the nervous functionings within an organ are neglected, and, beyond some sterile descriptive terms, few pathologists have given a real insight into pathological processes. What really determines osteoporosis or an osteitic infiltration—an eosinophilia, a leukocytosis, a blood formula of this or that character, an exudative inflammation, a cellular hyperplasia or a fibrous displacement.

As occasion offers we hope to present to our readers some views of the part played by the vegetative nervous system in the production of pathological phenomena. Our platform asserts that practically no pathological process can even approach an adequate understanding unless the integrating function of the vegetative nervous system is included in the description of the process.

Physiology, pharmacology, pathology, in terms of the sympathetic and parasympathetic (autonomic) activities, will therefore be discussed in our abstracts. As an example, much light has been thrown upon the formation of gastric and duodenal ulcers viewed in the light of a localized vagatonic reaction. This increased vagotonia, that is, overwhelming unbalance of the autonomic (vagus) stimuli, may be initiated by sympathetic paralysis on the one hand or by increased parasympathetic stimulation from many sources on the other—increased adrenalin output among them.

The entire field of the endocrinopathies will be covered in these abstracts, but we shall attempt to deal with the general principles rather than with the innumerable unclassified observations which have made this field of the endocrinopathies almost as insoluble a maze as the 13-14-15 puzzle. Our platform maintains that the



endocrine glands are organs, like other organs; they represent function that is structuralized in one place for greater efficiency—local dynamic depots. The cellular activities deal with specific chemical energies—as, iodine in the thyroid, calcium in the parathyroid and pituitary bodies, phosphorus in the pituitary, iron in the blood. These chemical substances are indicators through which similar chemical substances in the external world may be integrated within the body to carry on its energy-transforming function. The specific endocrine substances—hormones, chalone, or what not—operate chiefly through and by the vegetative reflex arcs which are always in a functional sympathetic-parasympathetic balance. Throw this balance out by some specialized activity, and harmony becomes an aim in the organism as a whole. Should that activity have demanded a large amount of calcium, the widespread usefulness of which in maintaining many standard reactions in the body is only just beginning to be appreciated, immediately the reserve organ—the parathyroid—gets busy and redistributes the available calcium of the body through its “Hoover Commissions,” *i. e.*, the specific parathyroid cells, acting on the sympathetic or parasympathetic distributing systems. Thus we shall discuss tetany, and the whole tendency to muscle jumpiness, or excess reflex activity, in terms of the control of calcium or other chemical metabolites through the more or less centralized activity of the parathyroid, or the excessive calcium deposition in pituitary difficulty as in acromegaly. Or again, we shall endeavor to show from another point of view how the tabetic process involving the orderly flow of vegetative arc reflexes may cause an osteoporosis (tabetic arthropathy) when bony constituents are prevented from getting to their usual sites, or are over-consumed in the functional unbalance of the sympathetic-parasympathetic arc.

These are but a few of the problems which the work in vegetative neurology is thrusting upon the attention of the practical worker in nervous and mental disease.

We shall reserve later numbers for the discussion of the platform of the *sensorimotor systems*, and of the *psychical systems*, reminding the reader that a three-layer-cake arrangement of the nervous functions is a feasible and practical working platform.<sup>1</sup>

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<sup>1</sup>JELLIFFE AND WHITE: Diseases of the Nervous System. 3rd Edition. See Introduction.

## "ENCEPHALITIS LETHARGICA"

A COLLECTED ABSTRACT

By SMITH ELY JELLIFFE, M.D., Ph.D.

This is too busy a world to permit mankind to occupy itself much with the past, and too strenuous a period to allow it even to dig very deep into the present. It is largely for this reason that the difficult investigation of the condition which has received a certain amount of prominence under the term "Lethargic Encephalitis" has had such an uneven history.

Forgetfulness of the past has invested a series of century-old phenomena with a new name and the reputation of being a "new discovery," and lack of precision in the present would discourage research from aiding one in arriving at better ideas of the behavior of the condition. Fortunately, however, the researches of the past few years are slowly digging out of the various reports on these forms of encephalitis, which may be more or less limited to the mid-brain region, certain indications by which a number of different types may be isolated.

This abstract review aims at giving a rapid summary of some of this more recent literature, pointing out the trend of research and the lines along which profitable inquiry may be made.

The more or less spectacular term, "lethargic encephalitis" was brought chiefly into prominence by v. Economo<sup>1</sup> in 1917, from cases seen in the psychiatric clinic of Vienna, the symptoms being characterized briefly by marked sleepiness, various eye palsies, weakness of the arms or legs, or paralyzes, tremors, or ataxias. The earlier observations were more or less supplemented by Pibram<sup>2</sup>, by Schlesinger, and Redlich<sup>3</sup>, all of whom observed syndromes similar to

<sup>1</sup>v. ECONOMO. Encephalitis lethargica. *Wiener Klinische Wochenschrift*, May 10, 1917, xxx, No. 21, p. 581.

<sup>2</sup>PIBRAM, H.: Ueber Encephalitis. *Deutsches Archiv für klinische Medizin*, 1918, cxv, pp. 160-7.

<sup>3</sup>*Wiener Klinische Wochenschrift*, July 26, 1917, Nov. 27, 1917.

those which had been observed during an epidemic in the winter of 1916-1917 in Vienna.

Just what types these represented is still being discussed, and it may be said that our present concentrations upon the old situations arose from Economo's presentation.

At this time investigators were not wanting whose historical perspective recalled that this type of case had been described with more or less precision for many centuries, and there were not wanting those who carried with increasing difficulty the tenuous trail back to Hippocrates, even to Homer.

At a more recent date, Crookshank has gathered together ample evidence, masked behind the broad general conception of influenza, to show that influenza epidemics have frequently, if not universally, been associated with this type of case.

Modern neuropathology can see no particular reason why this should not be so, since it recognized that a vast variety of different causes through action at or upon certain regions of the anatomical pathways can produce almost identical results, and that noxae such as influenza, pneumococcus infection, poliomyelitis, measles, syphilis, alcohol, food toxins, etc., respectively, can produce a mesencephalitis with the precise syndrome of lethargic encephalitis. Moreover it recognizes that, although these have all been found to be actual etiological factors, as a matter of fact, certain ones are more apt to be involved; this is really the nucleus of the problem.

It is fairly certain that the influenzal organism type may be said to have been the first to be recognized, and certainly the first to be outlined. Crookshank<sup>1</sup> has laid emphasis upon these features.

Tracing the history of epidemic pestilences he finds an interesting reference in Le Paulmier's work of 1578 to a "paraplegia inaudita sed lethalis quae in Thaso contigit." This "paraplegia of Thasus" is described by Hippocrates as follows:

"During this state of the weather, in the winter, paraplegias be-

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<sup>1</sup>CROOKSHANK, F. G.: Discussion on Epidemic Encephalitis. *Proceedings of the Royal Society of Medicine*, 1918, xii, No. 1. Section of Medicine, pp. iv, xii, xiv, xxi.

———A Note on the History of Epidemic Encephalomyelitis. *Boston Medical and Surgical Journal*, Jan. 8, 1920, clxxxii, No. 2, p. 34.

———"Botulism" and Heine-Medin Disease. *Lancet*, London, May 18, 1918, i, 699.

gan and attacked many, some of whom dy'd in a short time, for the disease was very epidemical. In other respects they were well. But, in the very beginning of the Spring, Burning Fevers came on, and continued to the Equinox, and even to the Summer. Most of those escaped who were seiz'd presently after the beginning of the Spring and Summer, and some few dy'd: but when the Autumn and wet weather set in, they prov'd mortal to many. These fevers were of such a nature that where any one bled freely and plentifully at the nose he was sav'd by it more than by anything else."

The Hippocratic constitution of this year was, it is obvious, almost identical with that of 1918, epidemic paraplegia taking the place of our epidemic "encephalitis lethargica." The observation of Hippocrates was doubtless just, for the prevalences of encephalomyelitis have invariably stood in a certain relation to epidemics, and endemic-epidemics, of the "burning fevers" which we call influenza.

Crookshank states further, "I do not wish, however, to occupy time with citations from the ancients. It is more convenient to begin with the century of da Vinci and Buonarrotti—in what doctors think the dark ages—when, however, as Hallam suggests, 'some parts of physical science had already attained a height which mere books do not record.'

"In the last four hundred and fifty years four periods seem to be indicated in respect to epidemic encephalomyelitis—four periods marked by different phases of medical thought and observation.

"During the first, which closes with the era of Willis and Sydenham, wide epidemic prevalences were observed and compared, as a rule, without resolution into component 'diseases'; and symptoms obviously due to forms of meningitis, encephalitis, and myelitis were described in relation to vast occurrences which we would now call 'disease-groups.'

"In the second period, which roughly coincides with the eighteenth century, systems of nosology were based upon symptoms, and symptom-groups due to encephalitis and myelitis, as well as to meningitis, were referred to nervous, comatose, lethargic, stuporous, convulsive, apoplectic, and paralytic fevers, usually considered as different elements of special epidemic constitutions.

"During the third period, which commenced about the year 1800, persistent efforts were made to distinguish specific diseases by



the findings of morbid anatomy. Cerebritis, encephalitis, meningitis, and myelitis were then described, sometimes as 'specific entities,' sometimes as characteristic lesions of specific fevers such as 'cerebral typhus' and the like, sometimes again as evidences of metastasis of disease from one part of the body to another.

"The fourth period, which commenced some thirty years or more ago, is characterized by the distinction of many specific diseases by association with specific organisms. It is to be hoped that this period will prove to be one in which medicine will so far profit by biology as not to neglect synthetic research in the pursuit of purely analytical investigation.

"There is, however, throughout the whole history of these four hundred and fifty years, one tendency, which is manifested by the persistent ascription of certain odd, detached prevalences of encephalomyelitis to varieties of food-poisoning."

We cannot here go into a more extended quotation from this, the last of Crookshank's papers, interesting and profitable though they be, but they give unmistakable evidence of the interoccurrence of at least two types of cases causing lethargy and eye palsies, namely the influenzal and poliomyelitis types. We can only quote the summary of one of these articles:

"(1) Clinical occurrences of the nature that we now ascribe to encephalomyelitis, or encephalomyelomeningitis, have been recorded in modern times for at least four hundred and fifty years.

"(2) In great part these occurrences have been noted as incidental to major prevalences, known historically as the sweating sickness, the epidemic catarrhs, or influenzas and the like.

"(3) Special prevalences of these occurrences have also been described as manifestations of special diseases. These special prevalences have usually appeared shortly before or shortly after major 'influenzal' epidemics, or else in geographical proximity to endemic-epidemic and endemic-influenzal prevalences.

"(4) Epidemic encephalomyelomeningitis represents an intensive and specialized reaction that has the same epidemiological relation to pandemic influenza as have the prevalences and epidemics of 'septic' pneumonia, of gastro-intestinal illness, and of other maladies described as occurring before and after the wide diffusions generally referred to as pandemic influenza.

"(5) Owing to the relative infrequency of endemic encephalomyelitis and its marked variation in type, historical investigation is necessary in order that contemporary occurrences may be viewed in a correct perspective."

In his Chadwick lectures Crookshank develops the same theme more extensively. A summary follows:

Crookshank pointed out that the affection known pretty generally on the Continent as the Heine-Medin disease (though in this country by the older names of infantile paralysis, or acute poliomyelitis), is usually said to have had a history of but a hundred and forty years. Nevertheless, there is reason to believe that in various guises it has been with us for centuries. A sketch of the disease as it has been regarded since the labors of Wickman in Sweden was given, and reference was made to the epidemic of 1916 in America, following "pseudo-influenza" in 1916, of 1917 in Australia (where it was called the "Mysterious Disease") and to the late epidemic in Great Britain, which was at first so erroneously confused with botulism, but is now, by various eminent authorities (if not by all) regarded as having represented a mood, less familiar than others, of the Heine-Medin disease. An outline was then given of the history of the growth of the present conception of the disease, from the allusions of Underwood in 1784 to a form of "debility of extremities," to the later writings of Heine in 1840, the investigations of Medin in 1890, and the later work of Wickman, who so extended our idea that we now have regard to an acute catarrhal infection, followed in many cases, but not in all, by nervous manifestations of a most varied character.

Incidentally it was mentioned that Sir Walter Scott's account of the origin of his own lameness in 1773 is one of the most precise of the early accounts of a case of "infantile paralysis." The lecturer then turned to a consideration of some Early English and Continental epidemics, showing how during the fourteenth, fifteenth, and sixteenth centuries many severe catarrhal, "sweating," or influenza-like epidemics were associated with the prevalence of cases of illness affecting the brain and spinal cord in a manner observed during the epidemics of Heine-Medin disease of late years; he pointed out, moreover, how frequently these epidemics were regarded as "new dis-

eases," and popularly connected with the consumption of certain articles of food, or with food deterioration.

The second lecture gave an account of the "Epidemical Feavour, chiefly Infestous to the Brain and Nervous Stock," described by Thos. Willis in 1661—a disease which has been the subject of discussion for many years, but which there is good reason to believe represents one form or mood of epidemic encephalomyelitis (which lately reappeared in this country, as in other times and places, concurrently or coincidentally with influenza and has been otherwise known as Heine-Medin disease, acute polio-myelitis, and, in part, as "infantile paralysis"). The history of various epidemics and prevalences described in Britain during the seventeenth and eighteenth centuries by Sydenham, Gilchrist, Butter and others, was related, and an account was given of contemporaneous and similar occurrences in France and Germany. The relation of some forms of disease once described as "Spinal Typhoid," etc., to the Heine-Medin disease was discussed. Reference was made in some detail, with special reference to the work of Wernicke and Oppenheim, to the checkered history, during the nineteenth century, of "encephalitis," a form of disease much discussed, often disputed and frequently "discovered." The lectures remarked that, just as M. Jourdain had spoken prose all his life without knowing it, so had the medical profession for many years witnessed these epidemics, and constantly hailed them as evidencing a "new disease." The ever-varying character of the symptoms and types that had led to so much discussion was possibly due to differences in the virulence of the poison, but was certainly connected with variations in the well-being and dietetic and sanitary conditions of the populations affected—*i. e.*, with the "soil" on which the seed was sown. Some of the severest outbreaks recorded were associated with peculiar local or "endemic" conditions, and evidence was brought forward of persistence of "type" in particular localities and districts.

The third lecture dealt with the history of two diseases, usually ascribed to forms of food-poisoning, which present or presented, in many respects, points of epidemiological and clinical resemblance to Heine-Medin disease, as now conceived: namely raphania and botulism. Raphania was the name given in the eighteenth century, by Linnæus and his pupils, to an epidemic disorder characterized by



mental affections, paralyses, and convulsions, which spread through Sweden in certain years of general prevalence of influenza, and which was ascribed by Linnaeus to the admixture of radish seeds with breadstuffs, though later German writers confused it with the *chronic* affections due to "ergotism." Raphania was thought to have reappeared in Italy in the middle of the nineteenth century, when influenza, cerebrospinal meningitis, and encephalitis, broke out in severe forms and were identified by Agostinacchio with the "Sweating Sickness." Botulism, the lecturer pointed out, was the original name given during the influenza periods of the nineteenth century to the form of disease, clinically identical with some types of poli-encephalitis, that had attracted attention in Wurtemberg as early as 1820, when Justin Kerner wrote a treatise tracing it to the consumption of blood-sausages and allied comestibles. Cases had already been noted in 1755. The lecture, after dealing with the later history of "botulism," suggested that it was probable that deficiencies in dietary had in the past intensified or aggravated the effects of the virus of what we now call "Heine-Medin" disease, and the influenza-like affections with which it is associated, and had thus played an important part in the production of the epidemics and outbreaks to which these names of "raphania" and botulism had been given. It was necessary, the lecturer insisted, to avoid ascribing primary importance to factors which are really secondary (in a logical sense), in the production of diseases, and equally important to remember that the effects and consequences of a virus such as that of influenza and allied affections are varied and determined (to an extent only appreciated perhaps by epidemiologists) by the many conditions and circumstances—the "soil" in fact, on which it may fall, as well as by the "Epidemic Constitution" of the year.

Recent research has, during the last few months, rudely shaken many of the claims put forward by the more orthodox of the laboratory students of the disease.

In conclusion the lecturer restated the main points to which he had addressed himself, insisting that, while the Heine-Medin conception of to-day was, in a sense, "new," yet the malady had been with us for centuries, and that almost the most striking fact in relation to it was its epidemiological association with the malady or maladies which we call influenza, pointed out by Borström in 1905.

The elucidation of this association would probably be a task of



some difficulty, and, if the conceptions of Heine, Medin, Wickman, Droper and others came to be merged into something yet more far-reaching, we should still remember how, in 1661, Thomas Willis of Oxford described for us, and gave us, the idea of "An Epidemical Feavour, chiefly Infestous to the Brain and Nervous Stock."

(*To Be Continued*)

FAIRBANKS, ARTHUR W.: Encephalitis Lethargica. *Boston Medical and Surgical Journal*, Nov. 13, 1919, clxxxi, No. 20, p. 578.

The article contains a complete description of this condition, including the clinical course, pathology, differential diagnosis, and treatment. The etiology is so far unknown, although Loewe and Strauss claim to have isolated a filtrable organism from nasal washings, which, when injected into animals, produced the disease. Cultures were carried to the twelfth generation. The affection is usually most prevalent during the months of March and April. It occurs at all ages.

The author divides the clinical course into two stages: (1) the prodromal, (2) the developed stage of the disease. The prodromal period lasts from one to five days. The prominent symptoms are headache, vertigo, blurred vision, and slowly developing lethargy. Sometimes diplopia, nausea, general abdominal pain and muscular twitchings are present. In the developed stage, fever varying from 99° to 103° F. (37.22° to 39.44° C.) appears, lasting from three to six days. The somnolence increases, and a striking symptom at this stage is the mask-like facies. The speech is slow, nasal, and often hesitant. As stupor increases the patient lies expressionless; catatonia is frequently present. In 75 per cent of cases palsies of the 3d and 7th nerves are observed. Among prominent symptoms are ptosis, either unilateral or bilateral, strabismus, diplopia, and evidences of facial palsy. Half of the cases reported by English authors show facial palsy. Occasionally the 4th, 6th and 12th cranial nerves are involved. Twenty-five per cent of cases show no cranial nerve palsy and these are the most difficult cases to diagnose. Constipation is present and is obstinate. Late in the coma stage bladder and rectal

incontinence may occur. The disease is as a rule free from signs of meningeal irritation. Kernig's sign is generally absent. The cerebrospinal fluid is clear, under some pressure, and there is a lymphocytosis in about one-third of the cases.

The minimum safe figure to set for the duration of the disease is six weeks. The emergency from lethargy and restoration to health is extremely slow. Impairment of intellect may remain. Ataxia may persist for a long time. The mask-like facies may often persist. The average mortality is 20 per cent. The mortality is four times greater in adults than in children.

*Pathology.*—Macroscopically, hyperemia is visible. A constant finding is a limited area of meningitis in the region of the interpeduncular space. Sections of nuclei, peduncles, pons, and medulla show numerous punctate hemorrhages, chiefly of venous origin. There is mixed hyperemia of vessels, and lymphocytic perivascular infiltration, especially pronounced in the region of the peduncles and floor of the 4th ventricle.

The two conditions from which this must be differentiated are acute anterior poliomyelitis and tuberculous meningitis, which can so closely simulate lethargic encephalitis that only a postmortem can decide between them. One thing to remember is that in tuberculous meningitis the meningeal irritation phenomena are present, whereas in encephalitis lethargica they are usually absent. This is a help in differentiation. As regards treatment the author has little to offer. Meeting symptoms as they arise, and bearing in mind the tendency of retention of urine to occur, as well as bed-sores and pulmonary complications, seem to comprise his suggestions.

M. M. BANOWITCH.

WESTPHAL, A.: Ueber das Vorkommen von Stäbchenzellen bei der multiplen Sklerose. *Neurologisches Centralblatt*, Jan. 2, 1918, xxxvii, No. 1, p. 2.

The author, in the extensive literature with which he is acquainted, has met with no mention of the occurrence of numerous rod-cells in multiple sclerosis. He therefore describes briefly from his experience a case with such postmortem findings. The case was remarkable for the presence of a large number of sclerotic foci of

all sizes, ranging from those only microscopically visible to those involving whole sections of the convolutions. These foci were situated in the central nervous system—in the cerebrum, cerebellum, pons, and medulla oblongata—being particularly numerous in the centrum semiovale, the temporal lobe, the large ganglia, and the regions situated near the ventricle. In the white substance of the spinal cord they were easily distinguishable because of their contrasting color and hard consistency. The rod-cells to which the author calls attention were found in the sclerotic foci in the medulla, more especially in the vicinity of the ventricle. These cell growths, which were first described by Nissl, correspond to those found by Alzheimer in progressive paralysis. Kraepelin also describes rod-cells in the postmortem findings of progressive paralysis, and states that they were found in narcolepsy by Spielmeyer, and that they have been found in other diseases of the cortex, although only in small numbers. Spielmeyer has called attention not only to the anatomical resemblance between progressive paralysis and multiple sclerosis, but also to the similarity of the histological findings. The author adds his findings of numerous rod-cells in multiple sclerosis as further confirmation of the histological similarity of the two diseases. The possibility is mentioned of proving by further research that the spirochetes discovered by Kühn and Steiner in multiple sclerosis stand in etiological relation to the disease. If such proof should be forthcoming the histological findings of plasma and rod-cells in both multiple sclerosis and paralysis would acquire added interest, because a question would then be in order as to whether the histological changes might not throw some light on the nature of the exciting cause of the disease.

S. E. JELLIFFE.

FRIEDMAN, E. D.: Brain Tumor. *New York Medical Journal*, Nov. 8, 1919, cx, No. 19, p. 765.

Friedman reports 2 cases of brain tumor in which the clinical diagnosis was verified at autopsy.

*Case I.* A forty-one year old tailor came under observation on January 22, 1917. His father had died at the age of fifty-five from some form of cerebral disease. One brother had died of tuberculosis.

His previous history is of no significance. The present illness began nine months ago with occipital headaches; several weeks after the onset of the headache, the patient began to "see double." There was no nausea. Some dizziness was noted, and weakness in the right hand and foot. For the last ten days before examination there was some difficulty in swallowing and in speech. The patient tended to fall to the right side.

Examination showed that both pupils were irregular but reacted to light and accommodation. The fundus showed a choked disc on the left side and distended veins on the right. There was paralysis of the left abducens, with dropping of the right angle of the mouth, and spasm in the left platysma. The tongue was slightly deviated to the right. Right hemiparesis was present, with a diminution of the right abdominal, cremasteric and foot-sole reflexes. No pathological reflexes were noted. Sensation was normal. No other signs or symptoms were present.

Three days later, there was a rapid nystagmus on looking to the right, and percussion tenderness of the right side of the skull. The patient stated that the pain was originally over the left occiput. The fundi showed the outline of the left disc to be indistinct, with swelling of the head of the disc. The right disc showed similar changes. Corneal reflexes were present. Spinal puncture was not performed. The urine was negative. A blood Wassermann on three different occasions was negative. Lungs and heart were negative.

The paralysis of the left abducens and the right hemiparesis (crossed paralysis), the nystagmus, and the choking of both discs, led Friedman to diagnose a tumor of the left half of the pons. The absence of definite sensory changes was anomalous. The patient subsequently went to one of the New York hospitals, where he died in April, 1917. The autopsy showed miliary tuberculosis and a large solitary tubercle in the pons.

*Case II.* A married man, packer by occupation (age not given), of good previous and personal history, came under the author's observation on Feb. 2, 1917. The present illness began six weeks before. While at work, the patient suddenly felt queer and became dizzy but did not lose consciousness. Fifteen days later, he became aphasic and was unconscious for an hour, but recovered sufficiently well to go home and to return to work the next day. Five days be-



fore the first examination he had another spell of dizziness with nausea and vomiting. There was no impairment of vision. No marked headache was present. The right half of the body felt weak.

Examination showed the pupils to be normal; there was some hemiparesis on the right side, and complete loss of sensation with hypesthesia of the cornea on the same side. There was definite astereognosis and loss of tactile perception. The deep reflexes on the right side were exaggerated. The abdominal, cremasteric and sole reflexes diminished on the right side. No pathological reflexes were noted. A blood Wassermann was negative. The spinal fluid showed no increase in cells or globulin, and gave a negative Wassermann reaction. The fundi were normal. Heart and lungs were negative. Blood-pressure was normal. X-ray of the skull showed a large sella turcica.

Owing to the abruptness of the onset and the periodical aggravation of the symptoms, the author first suspected a progressive cerebral thrombosis. About April 1, 1917, the patient began to suffer from headaches and vomiting, and became markedly aphasic. Alexia and agraphia set in. Blurring of the outline of the left disc was noticeable. Percussion of the left side of the skull showed tenderness and gave tympanic resonance. The pulse-rate dropped to 50 per minute. On account of these evidences of increased intracranial pressure the original diagnosis was changed to that of cerebral neoplasm, probably subcortical in the parietal lobe.

The patient was then transferred to the hospital, where the diagnosis of frontal lobe tumor was established and an exploration of this region performed. No tumor was found. A few days later the patient developed a meningitis and died. The pathologist reported "a primary subcortical neoplasm in the left parietal region. Microscopical examination showed that it was a perithelioma. The hypophysis was found to be enlarged to twice its normal size, due to diffuse adenomatous hypertrophy."

Friedman based his localization on the persistent astereognosis, the sensory changes, the absence of cortical convulsions, the transitory character of the aphasia, and the mild motor disturbances. The association of alexia, agraphia and aphasia, he thought, indicated a lesion of the subcortical association tracts.

M. KESCHNER.

PARSONS, W.: Neuroglia and Non-myelinated Fibers in Nerves.  
*Journal of Physiology*, Sept. 5, 1919, liii, Nos. 1 and 2, p.  
134.

An account is given of investigations carried out to determine the nature of certain fibers in nerve-trunks and posterior nerve-roots, which have been previously described by Ranson and which he supposed to be non-medullated fibers. The animals used were rats and cats. It is shown that the small fibers are inconstant in number in different nerves and in different parts of one nerve. The number decreases as one approaches the spinal cord on the one side of the ganglion and the periphery on the other. The fibers are further compared with the recognized neuroglia fibers of the pituitary body and of the substantia gelatinosa surrounding the central canal and in the filum terminale, with the result that both in the rat and the cat they are found to agree in character with the neuroglia tissue of the same animal, being smaller in the rat than in the cat. The conclusion drawn from this comparison and from the numerical distribution is that the small fibers are neuroglia fibers.

S. E. JELLIFFE.

SCHNEIDER, E.: Blood Coagulation Time and Dementia Praecox.  
*Monatschrift für Psychiatrie*, 1918, xliii.

H. Hauptmann and H. Bumke seem to have shown that there is an increase in the blood coagulation time over that observed on the average in catatonic and hebephrenic schizophrenics, and also in paresis; this is not true for other psychotic forms. Schneider's research, here published, fails to confirm this conclusion, and shows that the variability in blood coagulation time does not range beyond the margin of variability observed in subjects who are apparently non-schizophrenics.

S. E. JELLIFFE.

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# INTERNATIONAL MEDICAL DIGEST

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## SECTION ON GENERAL MEDICINE

MEREDITH, F. L.: Functional Heart Disturbances in Women. *Boston Medical and Surgical Journal*, Dec. 25, 1919, clxxxi, No. 26, p. 734.

A much larger percentage of women between sixteen and thirty years of age show signs of cardiac weakness than would be supposed. Many of these cases are considered to be organic, due to valvular defects, myocarditis, etc., while others are called "nervous heart," "weak heart," and so on. A better name would be myocardial subdevelopment. Of 2,000 examinations about 800 showed underdevelopment of the myocardium; 200 were considered to be probably or definitely organic; 40 seemed to be normal but somewhat strained. In the myocardial subdevelopment cases (800) the prominent symptoms were murmurs (710), tachycardia (520), and irregularity (390); 275 cases showed all three symptoms. The murmurs were soft, systolic in time, not transmitted, and most often heard after activity. The hearts were normal in size except in a few cases. The irregularity was not especially pronounced but was more so after exertion. The average increase in rate of pulse was 20 beats after moderate exercise. In the subdevelopment cases the rate dropped to normal in five minutes (more rapidly than in organic hearts). The blood-pressure was uniformly low, in 80 cases below 100 systolic. Anemia below 80 per cent was present in 200 cases. Respiration was slow, except after exertion, when it became rapid and labored. The chest was flat and often back rounded, and supra- and

infraclavicular depression were often present. The nourishment and muscular development were poor; only 30 per cent, or 240, were up to the average in weight. This work was carried out among all classes, 1,500 subjects being factory or mill operatives; 300 store or office clerks, 200 college girls and teachers. In testing these cases the author advises a system of graduated exercises under supervision with frequent re-examinations of the heart. One hundred and eighty-three girls carried out instructions and improved rapidly, the heart growing steadier and losing its tendency toward tachycardia. In some cases the murmurs disappeared, although this is the last symptom to go. Out of this series of 800, 442 had never had their hearts examined. Of those who had had their hearts examined previously (358), 123 had been told that they had organic heart disease.

M. M. BANOWITCH.

FINLEY, F. G.: Cardiac Disease with Extensive Venous and Cardiac Thrombosis. *Canadian Medical Association Journal*, Oct., 1919, ix, No. 10, p. 877.

Finley reports the case of a thirty-nine year old woman who was admitted to the Montreal General Hospital, complaining of pain in the chest, cough, and paralysis of the right arm and leg. The patient was married at twenty. She had had two living children and four miscarriages. Shortly after her marriage, she began to suffer from severe attacks of vomiting accompanied by headaches and pains in the epigastrium. These attacks lasted as long as three months at a time, but during the last seven years they had become less frequent and severe. There had, however, been an increased tendency to diarrhea. The patient's habits were good and she had always worked hard.

Her present illness began five weeks before admission, when she was taken suddenly with rather severe pain in the right side, and weakness in the arm and leg. The onset was also marked by severe dyspnea, which had been present only to a slight degree before. The pain in the side lessened, but the dyspnea grew worse, with cough and pain in the chest. There was some vomiting and also epigastric pain. Three days before admission the left arm became paralyzed and the patient found that her face was drawn to the right

side. On the next day she noticed a gradual loss of power in the left leg.

On admission, she was found to be very dyspneic, her cheeks were flushed and her lips blue. Her temperature was  $104.8^{\circ}$  F. ( $40.44^{\circ}$  C.). The pulse was small; blood-pressure was systolic 158, diastolic 120. The apex impulse was forcible, and in the nipple line, 9 cm. from mid-sternum. Cardiac dullness, beginning at the third rib, extended  $4\frac{1}{2}$  cm. to the right and  $10\frac{1}{2}$  cm. to the left of the mid-line. At the apex the sounds were muffled, with an occasional systolic murmur, and a marked protodiastolic gallop rhythm. There was a faint diastolic murmur at the pulmonary cartilage. Slight tenderness was noted over the mid-sternum and at the apex. There was dullness at the left base extending to the costal border in the lower axilla and obliterating Traube's space. Over this area the breath sounds were feeble, and vocal fremitus and vocal resonance could not be elicited, owing to the feeble voice. At the right base there were two finger breadths of dullness, feeble breathing, and crepitations. In the left axilla a pleural friction sound was audible. The liver extended one finger's breadth below the umbilicus, and had a vertical dullness of 21 cm.

The mouth was drawn to the right side on movement, but showed no change during rest. The tongue was slightly protruded to the left side. The left arm was rigid and totally paralyzed. The left leg was paretic. The knee-jerks were both increased; there was a definite ankle clonus on the right side (non-paralyzed side) and a tendency to one on the left. Double Babinski was elicited. Sensation was unimpaired.

Eleven days after admission the patient complained of severe pain in the left forearm. Fullness in the left supraclavicular region was noticeable, with tenderness along the axillary veins and in the veins at the bend of the elbow, with some enlargement of the veins of the forearm and front of the chest. The hand was slightly swollen, but the elbow was markedly edematous. A rounded and tender cord was present in the supraclavicular region and along the brachial vessels. This condition was regarded as a thrombosis of the brachial, subclavian and probably the innominate veins.

Nine days after this it was noted that the power of the right arm was rapidly returning, and that there was no trace of weakness in the face or leg. The Babinski and ankle clonus on the left side

were still in evidence. The left subclavian vein was felt as a hard cord but was not tender.

On the next day the patient began to complain of considerable pain in the right side of the neck and forearm, followed next day by fullness in the supraclavicular region, with tenderness down to the axilla. A cord was felt along the posterior border of the sternocleidomastoid muscle, and along the course of the brachial vessels; the veins of the forearm and front of the chest were slightly swollen and prominent. Swelling of the right forearm was present for a few days.

About three weeks later the patient became weak, and cyanosed; paralysis reappeared on the left side, in the face, arm and leg. Double Babinski, ankle clonus, and increased knee-jerks were elicited. There was incontinence of urine and feces.

During the patient's stay in the hospital, there was considerable dyspnea, and often orthopnea with moderate cyanosis. There was no change in the blood-pressure. The urine varied in specific gravity from 1.021 to 1.026, containing from .6 to .9 per cent of albumin, granular and hyaline casts, pus, and epithelium. The quantity varied from 150 to 500 and 600 c.c. daily. The temperature varied from 99° F. (37.22° C.) to 101° F. or 102° F. (38.33° or 38.88° C.) in the evening, and was usually normal or subnormal in the morning. There were short periods of apyrexia. Blood-counts showed from 8,200 to 9,200 white cells. Wassermann tests were repeatedly negative. Blood cultures were negative on several occasions. Electrocardiographic tracings were normal. Fundi were normal. The paralysis on the left side persisted, as did the incontinence of the sphincters. The dyspnea became more intense, the pulse weak and small; prostration was marked, and there were severe pains in the right thigh and in the abdomen, for which no satisfactory explanation could be found. The patient died eighty-two days after admission.

The autopsy was performed eleven hours after death. The heart weighed 500 grams; it was dilated and hypertrophied, and, in addition to postmortem clots, yellowish-grey clots were found adherent to the walls of the right auricle and ventricle and of the left ventricle. In both ventricles some of the clots were soft in the center and contained a brownish fluid resembling anchovy sauce. In the left ventricle one of these thrombi formed a large round collapsible



mass, 5 x 2.5 x 1.5 cm., attached to the apex, and also contained brownish fluid in the center. At this point the ventricular wall was thin, and fibrous tissue strands were seen to extend through to the epicardium. The coronary orifices were normal. A few fine warty vegetations were found on the aortic valve. The pleurae were adherent, and there were numerous areas of firm, dark red infarcts, in which thrombosed vessels could be seen on section. The left pulmonary artery was completely occluded by a granular, pink, antemortem clot. The left subclavian vein was completely occluded by an organized clot, while the right vein was filled with a granular, pink thrombus. A mass of clot was found in the superior vena cava, extending from its branches. The axillary glands were enlarged and congested. In the inferior vena cava there was a small mass of adherent clot below the diaphragm, extending into one of its branches. *Bacteriological examination* showed the *Staphylococcus aureus* in the blood, lung infarcts, and in the softened thrombus of the left ventricle.

During life the case was regarded as one of infective endocarditis. There were, however, certain features which rendered this diagnosis doubtful. The enlarged heart, with gallop rhythm, and the high blood-pressure, were more suggestive of cardiac hypertrophy with decompensation than of an endocarditis. The murmurs were of a temporary character. The diastolic murmur heard early in the disease was, judging from the autopsy, probably due to the clot in the pulmonary artery temporarily interfering with the closure of the valve, while the systolic murmur at the apex was one of relative mitral incompetence. While it is true that in endocarditis murmurs *may* be absent throughout the entire course of the disease, nevertheless it is usual for one or more to develop and *persist* during the malady. The absence of a palpable spleen, the low leukocyte count, and the negative blood cultures, were also not in harmony with the usual picture of subacute infective endocarditis. Tenderness over the sternum, as described by Libman, was present at one stage of the disease, but it was neither a prominent nor a persistent symptom.

The thrombi in the veins of the neck and arm correspond to the cases of venous thrombosis in cardiac disease, as described by Welch. This condition arises chiefly in mitral stenosis, and its localization in the upper part of the body, and especially on the left side, as it was in this case, is attributed by Welch partly to the greater length

and obliquity of the left innominate vein, and partly to the pressure on the left subclavian vein by the dilated pulmonary vessels. An infective process is most probably the immediate cause of the thrombus.

The presence of microorganisms in a cardiac thrombus raises the question whether these are the cause or merely the secondary invaders of the clot. Cardiac thrombi, as a rule, are sterile, and form in marantic conditions, especially when any localized area of degeneration is present in the heart-wall. That these conditions were present in this case, does not, in the author's opinion, enable one to exclude the possibility of a primary infection. Thrombi in veins are much more frequently associated with bacteria, than are cardiac thrombi. In the case reported the thrombosis was so wide spread in the veins of the body that the condition must have been due to some cause acting on the blood itself, and although it cannot be positively stated that it was due to bacterial invasion, this seems to be the most probable hypothesis. If this be admitted, it is logical to regard the cardiac clots as due to the same cause. The earliest clinical manifestation was the development of pulmonary infarction, and this may have been the starting point of the bacterial infection.

M. KESCHNER.

NORTON, W. H.: Myxoma of the Heart Simulating Bronchopneumonia. *American Journal of Medical Sciences*, Nov., 1919, clviii, No. 5, p. 689.

The author reports a case occurring at Camp Jackson: male, aged 29, diagnosis of pneumonia. Two weeks previously the patient had fainted twice from exertion. He complained of cough, cold, breathlessness, and was cyanotic. Rusty sputum was found on admission. Temperature was 99.4° F. (37.45° C.), pulse 146, respiration 52. Areas of bronchopneumonia were found. There were no murmurs; a Wassermann test was negative. Eight days later the temperature was normal and the lung signs improved. Six days later the patient's mind became confused and he developed signs of dementia precox. No murmurs were noted, but the first sound at the apex was impaired, and the diastole shortened. He died eleven weeks after admission. At autopsy, the heart was found to be enlarged, and weighed 510 mg. A myxoma, 9.5 cm. by 8.5 cm., was found in the left auricle, im-

planted by a broad base on the auricular wall. It was made irregular by polypoid-like growths developing in the line of least resistance, one bulging the fossa ovalis into the right pulmonary vein, and another into the mitral orifice.

All such cases should be reported so that a symptom-complex may be worked out for cardiac tumors. They require several days or weeks of observation. The intermittent character of symptoms is emphasized. Symptoms depend, to some degree, upon the position and size of the tumor, with reference to the blood-flow. Organic heart lesions produce more constant symptoms.

A. T. MAYS.

CLAPP, C. A.: The Diagnosis of Arteriosclerosis from an Ocular Standpoint. *The Archives of Diagnosis*, April, 1919, xi, No. 4, p. 257.

There is an almost universal failure to examine under considerable magnification (16 times) the smaller arteries and arterioles in the only place in which they are visible in the human body, namely, the fundus oculi.

The variation in the eye-grounds as seen by the ophthalmoscope may show its effect in the retinal vessels, the choroidal vessels, the nerve-head, and the retinal pigment.

All cases of hypertension do not show vascular changes in the fundi, nor do those cases which show very marked changes always show increased blood-pressure.

#### *Diagnostic Findings:*

(1) Increased tortuosity of the retinal vessels, with alterations in size and breadth, broadening of the light streak with an occasional beaded appearance. Physiological tortuosity may be seen in hyeopes.

(2) Dipping or cupping of veins as they cross the retinal arteries, with occasional dilatation in a peripheral part. This is the most characteristic feature of a well-marked case of ocular arteriosclerosis.

(3) An edematous condition of the retina with hemorrhages of irregular extent and occasional exudates. Hemorrhages are most frequently in close proximity to the vessels. Exudates are usually small in the region of hemorrhages.



(4) Blurring of the optic nerve-head and at times marked optic neuritis. This usually begins in the superior nasal quadrant and is closely associated with retinal edema.

(5) Disturbances of pigment about the macula. The appearance is usually one of lighter and darker areas, described as a "moth eaten appearance."

(6) Arteriosclerosis of the choroidal vessels. This is rare compared to retinal vessel changes. The choroidal pigment seems to be absorbed and the tortuous vessels show dimly through the retina.

L. B. ECKERSON.

BECK, C.: The Diagnostic Value of the Study of Pathologic Changes *in vivo*. *The Archives of Diagnosis*, January, 1919, xi, No. 3, p. 173.

The study of this subject is practically limited to the past twenty-five years. The method is essentially the same as the study of diagnosis on the dead or on the specimen, but the conclusions are different, for during life the conditions may differ widely from those found after death. It is of the utmost importance that we should know the changes in tissues brought about by diseases during life. However, there are a great many pathologic conditions of the body in which no operation can be performed that would warrant exposing these signs for our investigations during the process of the disease. The methods chiefly employed in the study are:

- (1) Those conditions which can be detected by the eye.
- (2) Those which can be detected by touch.
- (3) Those which can be detected by odor.

The eye distinguishes color, which undergoes many changes, depending upon the condition of the tissues. It is modified by the circulation, as in inflammatory, regenerative or degenerative processes. It changes when death occurs. That is, an organ found to be pale at autopsy was, as a matter of fact, congested prior to death. On the other hand, after death the coloring matter of the blood often permeates the tissues rapidly and changes normal looking tissues into deeply congested and highly colored ones. Premortal hemorrhages and blood diffusions may also be mistaken for pathologic conditions.



Exudates in particular change their appearance postmortem. Edema, an important symptom of pathology *in vivo*, has an entirely different aspect postmortem, inasmuch as effusion of water postmortem may cause the edema.

Touch or tactile sense is important, for the experienced surgeon's finger often reveals what cannot be seen. This may be the only means of making a pathologic diagnosis, for example in cases of adhesions, swellings, infiltrations, foreign bodies, movements of pulsation, contractures—none of which have significance postmortem.

The odor of tissues is of the greatest importance to the experienced observer.

It is therefore important in the study of pathology *in vivo* to have actual experience at the operating table, and the opportunity to examine the fresh specimens obtained there. In addition, experiments upon animals should be added to all the other laboratory methods and postmortem findings.

L. B. ECKERSON.

HARROWER, HARRY R.: Clinical Results With a Method of Testing Thyroid Function. *Medical Record*, Nov. 1, 1919, xevi, No. 18, p. 722.

Harrower recalls that there are two distinct varieties of goiter: (1) the simple enlargement of the thyroid, which is an effort on the part of the body either to supply an increased demand for its particular product, which may be deficient, or to produce a greater supply than usual because of an increased demand for it; and (2) hypertrophy of the gland due to toxemia or some other form of irritation. The simple goiters are usually benefited by treatment with thyroid extract, iodine, etc., thus tending to supply, in part at least, the need of the body. In the second variety, however, the thyroid gland is being overworked and driven faster than normal. The therapeutic administration of thyroid extract in this variety is most detrimental. To differentiate between these two varieties the author gives the patient a package of "thyroid-testing capsules," which contains twelve capsules of three graduated strengths,  $\frac{1}{2}$ , 1 and 2 grains (0.032, 0.065, and 0.13 gram) of thyroid, with a pulse chart and explicit instructions as to how to fill it out.

At the consultation the first pulse-counting is done and recorded;

the patient then counts the pulse again at 6 and 9 o'clock; the following morning he commences to take the four small capsules at 8, 10, 12 and 2 o'clock, recording the pulse at 9, 12, 3, 6 and 9 o'clock. On the second day, the four medium sized capsules are taken at similar hours, and the pulse is recorded under as nearly identical conditions as possible, and at the same hour.

During the third day the four large capsules are taken at the same hours as previously and the pulse recorded as before. The fourth day, or the "first day after" finishing the taking of the capsules, the pulse is recorded as before, and again in the morning of the fifth day, when the chart is completed and the data thus secured are carefully evaluated.

It is important to watch for symptoms such as temperamental or nervous irritability, twitchings of the eyelids, fingers and lips, breathlessness, and other nervous manifestations. Should these symptoms become prominent on the second or third day, no more capsules are taken, but the chart is completed and on its reverse side the time of onset and the character of the untoward effects are noted. The pulse is always taken under as nearly uniform conditions as possible, preferably before meals, after a ten-minute rest, and sitting.

In the hypothyroid cases, practically no difference in the pulse curve is found, and inasmuch as in these cases the heart action as well as any other body function is lazy and slow, the pulse curves are low and remain so. In the normal individual the thyroid feeding temporarily rouses the thyroid function, and through it the rate of the heart's action, so that these cases show an increase in the pulse, which, however, is due to the thyroid administered rather than to any excess of thyroid hormone which may be produced in the body. Inasmuch as these products are destroyed quite rapidly, the stimulating effect on the heart lasts during the time of the greatest dosage of thyroid, and comes down to normal again the day after.

In the various stages of thyroidism, the pulse findings are characteristic: the greater the susceptibility, the wider the range. The average pulse-rate is somewhat higher than normal, and there is also more irregularity than usual. Early in the administration of the thyroid, the pulse becomes more and more rapid until, during the height of the gland feeding, it reaches well above any possible normal figure—110, 120 or even higher. Furthermore, on account of the

increased activity of the hypersensitive gland, following the removal of the medication, *i. e.*, "the day after" and "the second day after" the pulse still remains high.

In cases of well-defined hyperthyroidism with tachycardia the diagnosis is clear, and there is no necessity for employing the test, and in the latent cases in which there is a high degree of thyroid sensitiveness the routine advice calls for the omission of the last four capsules and the continuation of the pulse tracings, with a note of the facts on the chart. In these cases the variations in the pulse-curve will not be so exaggerated (because the test has not been completed), but the indications are equally obvious and helpful.

The test is of greater help in the discovery of thyroid apathy or latent thyroid hypersensitiveness than in the diagnosis of frank hyperthyroidism.

Harrower calls attention to one other class of cases which may benefit from the use of the test. He refers to the chronic toxic and metabolic disturbances, such as rheumatism, neurasthenia, tuberculosis, etc., in which elimination is subnormal and there appears to be a reduction in the process of oxidation. In these cases the test may show a marked degree of thyroid apathy, and the administration of thyroid will obviously be a beneficial therapeutic agent. The thyroid test will also indicate clearly the presence of thyro-adrenal insufficiency in many tuberculous persons. When this is corroborated by proper blood-pressure findings and uranalysis, mixed gland treatment is indicated. On the other hand, the author warns that since the thyroid gland is expected to react to toxic stimuli, a latent hyperthyroidism may be present and be easily discovered by the test. In this case treatment with any of the glandular extracts which might be in order would be the opposite of that given to the other tuberculous persons in the class mentioned above.

M. KESCHNER.

HAMMAN, LOUIS: The Significance of a Small Amount of Sugar in the Urine. *Canadian Medical Association Journal*, Nov., 1919, ix, 961.

When, unexpectedly, in the course of an examination of a patient, a small amount of sugar is found, the question is at once raised: Has the patient a mild form of diabetes mellitus, and if not what other



significance is to be attached to the finding? If the patient has a mild diabetes it would be inexcusable to allow him to remain untreated. If the symptom is no innocent abnormality, and yet the patient has no diabetes, it is necessary to push the investigation further in order to determine, if possible, the underlying cause.

Nearly all mild glycosurias are postprandial glycosurias. In the early morning, after the night fast, the blood-sugar is at a low level; after each meal it rises somewhat, to fall again after two or three hours. The degree to which it mounts depends upon the quantity of food ingested, particularly the quantity of carbohydrates. Therefore the best time to examine for sugar in the urine is from two to three hours after the largest meal of the day has been taken. It is therefore important that every physician should, as a routine, order patients to bring two separate specimens of urine, one from the night and one from the morning, and not to urinate after the evening meal until the time for collecting the specimen arrives. Under these circumstances, sugar in the evening specimen and none in the morning would indicate a mild or slight glycosuria, sugar in both specimens a more severe glycosuria.

Inasmuch as most physicians regularly use alkaline copper solutions in testing for glucose, Hamman warns that it is important, when reduction occurs, to determine whether the reducing substance is glucose or some other substance in the reagent. This is particularly important when the reaction is slight. If there is the slightest doubt about this he advises the use of the fermentation test.

For the proper determination of the significance of a small amount of sugar in the urine it is well to bear in mind that sugar occurs in the urine when (1) the blood-sugar exceeds a certain high level, or when (2) the renal permeability for glucose is increased. In normal individuals the fasting blood-sugar is usually below 0.1 per cent, and even after meals rich in carbohydrates it rarely exceeds 0.14 per cent. Careful studies of the renal threshold for glucose have shown that ordinarily no sugar appears in the urine until the concentration of sugar in the blood exceeds 0.17 per cent. This threshold is not uniform in the same individual at all times; it may, however, for all practical purposes, be considered a reasonably constant factor. Patients, therefore, who excrete sugar only when the blood-sugar exceeds 0.17 per cent are said to have a *hyperglycemic glycosuria*, whereas



patients who excrete sugar although the blood-sugar remains considerably below 0.17 per cent, are said to have a *renal glycosuria*.

It is impossible to distinguish definitely between hyperglycemic and renal glycosuria without studying the blood-sugar. A comparison of the fasting blood-sugar and of the blood-sugar following a meal rich in carbohydrates, ingested at a time when sugar is being excreted in the urine, will usually make the distinction clear. There are, however, some possibilities of error. The blood-sugar concentration varies with remarkable rapidity, so that the result obtained from the examination of a single specimen is not always indicative of the highest level. If the blood-sugar happens to be high it means, of course, that the patient has hyperglycemia, but if the blood-sugar is low it is not justifiable to conclude that the kidneys are hyperpermeable. When glycosuria is once established, glucose will continue to flow off in the urine after the blood-sugar has fallen below the level at which the glycosuria began. Therefore, even though the blood-sugar is low while sugar is being excreted, this does not necessarily mean that the patient has a low *renal* threshold for sugar. To overcome these difficulties, the blood-sugar is taken in the morning after the night fast, and the urine examined. Immediately thereafter 1,543.23 grains (100 grams) of glucose are administered in lemonade, and half an hour, one hour and two hours thereafter the blood-sugar is determined and the urine examined for sugar.

Normal individuals react to this test with a rapid increase in the blood-sugar which, as a rule, does not exceed 0.14 per cent. The high point is usually reached at the end of half an hour, and the original fasting level after an hour or an hour and a half. No sugar appears in the urine.

Patients with low carbohydrate tolerance react with a much higher increase of the blood-sugar, and the increase lasts much longer. The blood-sugar goes to 0.18 per cent or more and three, four or more hours elapse before it reaches the original fasting level. When the blood-sugar exceeds 0.17 per cent, sugar appears in the urine and continues to be excreted while the amount of blood-sugar is above this level, and even for some time after it has fallen below it.

In some normal individuals, and in patients with increased carbohydrate tolerance, there is only an insignificant increase in the blood-sugar, and no sugar appears in the urine. Occasionally an apparently

healthy person will show a normal blood-sugar response, but unexpectedly sugar will be found in the urine. Such an individual utilizes sugar in a perfectly normal way, but the kidneys are hyper-permeable to glucose; the individual is then said to have *renal diabetes*. These cases of renal diabetes are characterized by slight and transient glycosuria. It is important to distinguish these from mild forms of diabetes. In the former there is no disturbance of carbohydrate metabolism and no tendency to progression. Renal diabetes has been called *diabetes innocens*; it is a benign disorder, with an excellent prognosis, and while it may be prudent to restrict carbohydrates moderately, a rigid antidiabetic diet is not necessary.

In contrast to patients with mild renal diabetes, are those patients who show a postprandial glycosuria and who respond to the sugar tolerance test, not only by excreting sugar in the urine, but also by displaying the typical curve of low sugar tolerance. As a rule, glucose appears in the urine only when the blood-sugar exceeds 0.17 per cent., but at times sugar may appear in the urine, although the blood-sugar is not above 0.14 per cent, and at other times no glycosuria occurs, although the blood-sugar may exceed 0.2 per cent. In Hamman's experience, a low renal threshold is found in diabetes only when the disease is moderately or quite severe. He has never encountered it in patients who showed only a small amount of sugar in the urine. However, even severe cases of diabetes with a low renal threshold may be contrasted with cases of renal diabetes by the characteristically protracted blood-sugar reaction to the sugar tolerance test. A high renal threshold in diabetes, *i. e.*, a failure of glucose to appear in the urine when the blood-sugar is at or above 0.2 per cent, occurs only when a kidney lesion coexists with the diabetes, or in the late stages of the disease.

There are a number of other conditions besides diabetes in which an occasional glycosuria may be met with. Chief among these are disturbances of the thyroid and pituitary glands, hypertension, nephritis and cerebral disease. These conditions are all characterized by a hyperglycemic glycosuria, and as far as one can judge from the glucose tolerance test, there is in all of them the same disturbance of metabolism. If the amount of sugar in the urine is large and constantly present it is strong presumptive evidence in favor of true diabetes.

It is a well-known fact that patients with Basedow's disease not infrequently show a little sugar in the urine. In hypothyroidism, particularly in myxedema, there is a marked increase in sugar tolerance. The pituitary gland exercises a control over carbohydrate metabolism similar to that of the thyroid. In fact, more marked grades of glycosuria occur with overactivity of the pituitary than with hyperthyroidism. The frequent association of mild diabetes with acromegaly is a well-established clinical fact.

Glycosuria occurs frequently after injury to the skull, after cerebral hemorrhage, after convulsions, and in conditions associated with increased intracranial pressure. In all of these conditions the glycosuria depends upon stimulation of the hypophysis and, according to the author, the mechanism is the same as in primary disease of the pituitary [Alimentary glycosuria may, according to Jaksch, be an objective symptom of the traumatic neurosis; the use of about 1,543.23 grains (100 grams) of grape-sugar produces transient glycosuria which makes its appearance within from two to six hours. Holdke has found glycosuria the day after the accident in 60 per cent of his cases. Tumors of the fourth ventricle give rise to glycosuria (cysticercus)—Abst.].

In acute nephritis, slight glycosuria occasionally occurs as a manifestation of impaired renal function with a lowered renal threshold for glucose. In simple hypertension and in chronic nephritis with hypertension, a little sugar is frequently found in the urine. In these cases the sugar in the urine represents an altered metabolism, for the glucose tolerance test shows a high and prolonged blood-sugar curve.

In late stages of diabetes mild grades of nephritis and hypertension are frequently met with. The clinical pictures here become quite confusing. The author approaches this question from the following standpoint. If with hypertension and chronic nephritis there is but an occasional trace of sugar in the urine, and the blood-sugar is not unusually high, he considers the disordered carbohydrate metabolism to be subordinate to the renal or vascular condition. If there is marked glycosuria and the blood-sugar is very high he considers the diabetes of supreme importance. In all cases he pays unusual attention to the clinical history. Patients past middle life with mild diabetes often gradually develop nephritis and hypertension, so that eventually the renal and vascular conditions assume the prominent



position in the clinical picture. On the other hand, he has observed patients with hypertension for a number of years, and has seen them gradually develop glycosuria and finally a definite intolerance for carbohydrates.

The author concludes his article by emphasizing the fact that whenever doubt exists as to the true nature of the condition, the patient is to be given the benefit of the doubt and is to be treated as a diabetic. "In this way," he adds, "some patient may be put to unnecessary inconvenience, but none will be harmed, whereas to overlook and neglect a slight diabetes will surely be followed by injury to the patient."

M. KESCHNER.

FINE, JAMES M.: The Necessity of Accuracy in the Diagnosis of Tuberculosis. *Medical Record*, Nov. 22, 1919, xevi, No. 21, p. 836.

The author emphasizes the well-known fact that errors in the diagnosis of tuberculosis are due to the faulty interpretation of apparently slight signs and symptoms and to the carelessness of some physicians in making merely a cursory examination or in treating the patient symptomatically without any examination at all. He reiterates the importance of the application of all scientific methods of diagnosis, in conjunction with the family and personal history, subjective and objective signs and symptoms manifested by each individual case.

Valuable symptoms are as follows: hemoptysis, slightly accelerated pulse and a slight rise of temperature in the afternoon, fatigue on slight exertion, loss of weight, and short cough with or without expectoration.

The best method of obtaining physical signs is to have the patient stripped to the waist and seated at ease on a stool with his muscles relaxed and his face toward the window so that the movements of the chest can be properly studied.

Through the use of the thoracimeter, retractions above and below the clavicles, chest deformities, muscle atrophies and limitations of movement of the affected parts can be exactly noted. The use of the thoracimeter (*Jour. Am. Med. Assn.*, 1916, lxvi, 186) is based upon the recognition that a diminution in the expansive power of the lung, no matter what the particular explanation for it may be,



is now universally regarded as one of the early signs of apical disease. The muscular contractions and spasms pointed out by Potenger can also be accurately estimated by the use of this instrument.

By putting the palm of each hand on the corresponding side of the chest the resistance and movement of the chest can be definitely determined. By placing the hand over the apices with the finger tips just below the clavicles and exerting equal pressure, with the patient breathing a little deeper than normally, it can readily be noticed that the affected side does not give as much resistance as the other side. Tactile fremitus is usually increased on the affected side, but this generally occurs later in the disease.

In eliciting the sounds of vibration by percussion Fine prefers the use of the medium and light stroke, percussing from below upward and comparing each side. The apical isthmus can be nicely mapped out on percussion where one finds a contraction on the affected side. Sometimes a slight change in the pitch of the percussion note may be the only physical sign of a tuberculous process. Change of pitch and deviation of sound are important to determine the resonance at the midaxillary and scapular lines. For this purpose, the patient is asked to hold his breath at the end of inspiration and again after full expiration; the width of the excursion is then measured and recorded. This measures the movements of the lungs in the pleural sinus, and is often found diminished or absent on the diseased side.

The most practical mode of detecting incipient tuberculosis is by auscultation. Bendlier calls attention to the hoarse vesicular sound in early apical involvement. The author finds the whispered voice method, described by Beifeld, very helpful. The patient is instructed to whisper "one, two, three," several times in a single breath, after which he takes a deep inspiration; this brings out any râles which may be present in the apex. Prolonged expiration is not of much significance in early diagnosis, and is not always due to tuberculosis. Fine râles localized in one portion of the lung, if they are persistent and do not disappear on coughing, are a most trustworthy sign in early tuberculosis; they are best brought out by telling the patient to expel forcibly all the air from his lungs, followed by a short cough, after which a deep inspiration is taken. Râles heard symmetrically at both bases, without dullness or change in breathing, are not, as a rule, due to tuberculosis. The same may be said of râles heard at the

pulmonary margins. To eliminate adventitious sounds and râles caused by heavy breathing, best heard in the costosternal or sterno-clavicular articulation, the author instructs the patient to cross his arms to the opposite shoulders and hold them firmly against his chest, and to breathe easily; this also gives one an opportunity to hear the constant râles in a well-developed muscular individual. He emphasizes the necessity of bearing in mind that pathological conditions in the nose may sometimes transmit peculiar sounds to chest; to obviate this, mouth breathing must be insisted on during the entire examination.

In normal children auscultation of the spinous processes reveals tubular breathing, as low as the bifurcation of the trachea. In cases of enlarged mediastinal glands in children, the tubular breathing is heard lower down. This is known as *d'Espinois sign*. In children the disease may be limited to the glands in this region, and can then be discovered only by the *x-ray*. Tuberculosis of the hilus, parenchymatous infiltration and the fan-like expansion of the peribronchial type, can only be detected by the *x-ray*.

In doubtful cases repeated examinations must be made and all scientific methods utilized, such as complement-fixation, radioscopy, cutaneous test, etc. No single sign can be said to be pathognomonic of pulmonary tuberculosis. A negative sputum does not exclude the diagnosis; in tuberculosis without ulceration one hardly ever obtains a positive sputum.

Cutaneous tests have proven to be of some value in the author's clinics. During the last two years, 1,530 children from exposed families in which one or more members had active tuberculosis, were given the Von Pirquet test, with the following results:

Von Pirquet, positive—physical examination, negative—344 or 22.4 per cent.

Von Pirquet, negative—physical examination, negative—798 or 52.1 per cent.

Von Pirquet, positive—physical examination, positive—376 or 24.5 per cent.

Von Pirquet, negative—physical examination, positive—12 or 0.8 per cent.

This shows that 45.5 per cent of the total number of children examined have given a positive Von Pirquet, and 52.9 per cent of all positives have had positive signs in the chest, while 52.9 per cent of

all examined were negative to the test; of this number only 1.4 per cent showed positive physical signs of chest involvement.

Fine concludes his paper by stating that physicians are beginning to recognize that the complement-fixation test is of value in doubtful cases, and that repeated negative findings over a considerable period of time show that the individual has been cured or that the disease is not present.

M. KESCHNER.

BROWNING, C. C.: Value of Tuberculin Cutaneous Test. *North-west Medicine*, Nov., 1919, xviii, No. 19, p. 230.

From experience gained in the County Hospital, Health Department, Tuberculosis Society, and private practice in Los Angeles, Browning believes that the cutaneous test with tuberculin is not to be considered a purely diagnostic agent, but rather a measure of free antibodies to tuberculous antigen, and that as such it is an aid in diagnosis, prognosis and treatment.

After describing in detail the mode of applying the test, he divides the reactions into three types:

*Type I.* From six to twelve hours after the application of the reagents a slightly elevated area of vivid redness makes its appearance, with a sharp margin, which reaches its maximum in from twenty-four to forty-eight hours. The size of this area may vary from a quarter of an inch to one inch in diameter. This remains about the same for three or four days, when it begins to fade gradually, leaving a brownish pigmented area which may last for a few weeks. This type is most frequently met with in the case of patients who are well nourished, moderately active and of good resistance.

*Type II.* This begins like Type I, but is not as marked and fades away in a few hours. It approaches the condition of negative reaction due to inability to react on account of the patient's poor physical condition.

*Type III.* This form is a delayed reaction running a chronic course and is met with in the very chronic fibroid or arrested cases. The reaction may appear only after a period of from twenty-four hours to four days; the reacting area is more livid in appearance; it takes from three to five days or more to reach its maximum size, which is, as a rule, less than half an inch, and remains unchanged anywhere from a week to a month, fading very slowly, and in some



cases requiring months to disappear. This type of reaction is found in cases with chronic unhealed lesions or in those in which arrest has occurred and remained inactive for several years.

Browning summarizes the prognosis of cases with or without reaction as follows: In patients showing signs of early tuberculosis who are in good physical condition, and give a Type I reaction, he gives a favorable prognosis, increasingly so in proportion to the intensity of the reaction. In cases which give a negative or a Type II reaction, being otherwise seemingly favorable, he gives a very guarded prognosis, and he warns that in these cases efforts should be made to determine a cause for this type of reaction other than the tuberculous infection. Anemia with less than 70 per cent hemoglobin frequently gives a weak or a negative reaction, which may be changed by the administration of sodium cacodylate or other remedies which stimulate the production of hemoglobin. Affections of the gastro-intestinal tract, and other conditions, will frequently change the reaction. Apparently healthy people who give a Type III reaction are of high resistance to tuberculosis, having undoubtedly had an active process at one time.

The author points out that these reactions also give a clue as to the therapeutic dosage of tuberculin. In cases with small foci of infection and a very acute reaction, he begins with a very small dose, even as low as 0.000001 mg., of tuberculosis vaccine, or other similar preparation, increasing with care until the sensitiveness of the patient is determined and overcome. The sensitive cases, in his experience, respond quite as well to small doses as the less sensitive do to larger doses, frequently better, the object of treatment with tuberculin being not necessarily to get the patient to tolerate any particular dose, but to stimulate the production of antibodies.

M. KESCHNER.

GOODALL, J. R.: Vaccination by Subcutaneous Injection. *American Journal of Medical Sciences*, Nov., 1919, clviii, No. 5, p. 721.

The author reports the cases of 6,000 men in the Canadian Army vaccinated hypodermically. After preparation of the vaccine four medical officers vaccinated 1,100 men in two and one-half hours, by using a 20 c.c. Record syringe, and injecting 1 c.c. into 20 men successively, changing the needle after each injection. No dressing



was required, and secondary infection was practically eliminated. The local reaction was like that following antityphoid inoculation. The percentage of positive reactions was very high. In only a small percentage of cases did the local and general symptoms cause complete incapacity. Some of the officers' children were vaccinated in this way without difficulty, owing to the rapidity with which the injection was given.

A. T. MAYS.

RUH, H. O.: A New Double-way Syringe for Use in Intravenous Medication, Transfusion, and Aspiration. *The Journal of Laboratory and Clinical Medicine*, Nov., 1919, v, No. 2, p. 123.

A syringe is described in which the barrel is the same as in all glass syringes, but in which the plunger has a bore running through its entire length, while at the upper end it is so drawn out that a rubber tubing can be securely attached. The apparatus is used by placing a rubber attachment on the lower end of the syringe which will fit a needle inserted into the vein, and attaching a gravity system to the other end of the syringe. Fluid may be injected as slowly as desired by applying pressure to the tubing next to the needle, thus forcing the plunger out by the pressure of the gravity system. Then the pressure is released on the rubber tubing next to the needle and applied to the rubber on the gravity system. The fluid may then be introduced as slowly as possible by pressure on the piston. Blood may be withdrawn in the same way, by applying pressure on the tubing furthest from the needle and pulling out the piston, thus filling the barrel, then applying pressure on the tubing next to the needle and releasing it above, and pushing in the plunger. The author's diagrams make the method quite plain.

C. M. ANDERSON.

OUSLEY, JAMES W.: Duodenal Lavage in the Treatment of Catarrhal Jaundice. *Southern Medical Journal*, Oct., 1919, xii, No. 10, p. 597.

The therapeutic indications in acute catarrh of the bile-ducts are to keep the bowels open by the use of salines and to increase the

solubility of the bile by means of alkalis. Ousley follows these indications by means of duodenal lavage, which stimulates the flow of bile by dislodging plugs of mucus, and lessens the catarrhal inflammation of the mucous membranes. In this manner constipation and intestinal stasis are overcome and the metabolism corrected.

Ousley uses the duodenal tube of Rehfuss for this purpose. The patient, on an empty stomach, swallows the tube, lies down on his right side, and drinks a glass of water; the gravity brings the small lead sinker of the tube near the pylorus, and the peristalsis pushes it into the duodenum. The duodenal contents are now aspirated to determine whether the tube is in the duodenum. The contents usually consist of pancreatic juice, bile, and some secretions from the duodenum; the mixture is clear, viscid, golden yellow in color, and alkaline in reaction. The tube is then attached to an ordinary rubber bag or to an irrigator containing the irrigating fluid, the patient turns on his back, and the fluid is allowed to flow into the duodenum by the Murphy drip method. In order to avoid distention of the bowel and to allow peristalsis to propel it gradually onward, from ten to fifteen minutes are allowed for 1,000 c.c., to run in.

The best solution for the treatment consists of:

Sodii bicarbonatis	{	..... 2 drams
Sodii sulphatis		
Sodii salicylatis		..... 1 dram
Aquæ distillatæ		..... 1 liter

This is followed by 15 c.c. of a 20 per cent solution of argyrol. The author uses ordinary tap water because cold stimulates the gall-bladder and the bile-ducts. The treatment is given every other day. The patients experience a remarkable feeling of well-being and do not seem to mind how long the treatment is carried out. During the progress of the treatment, the patients are instructed to drink alkaline mineral waters freely and to eat wholesome, fresh, non-irritating food with a limited amount of sugar and fats, and no tea, coffee or cocoa.

M. KESCHNER.

Boyd, W.: Some Uses of Non-specific Protein Therapy. *Journal of Laboratory and Clinical Medicine*, Nov., 1919, v, No. 2, p. 88.

The therapeutic effect of non-specific protein reactions is more marked when the protein substance is given intravenously than when it is given by the subcutaneous method. Many explanations have been offered for the beneficial effect following foreign protein injections producing protein shock, characterized by rigors, hyperpyrexia, sweating, marked leukocytosis, increased flow of lymph, and rise in both the ferment and antiferment content of the blood-serum.

The increased flow of lymph brings the antibodies which are present in the blood into contact with any bacteria which may be lodged in the lymph spaces. The increase in the ferment causes increased hydrolysis of the toxins into non-toxic forms. The anti-ferment power of the serum is due to the presence of lipoids in the form of unsaturated fatty acids, which are increased as a result of protein injections, so that absorption of the lipoids occurs at the surface of the bacteria, resulting in the injury or destruction of the latter.

The method of protein therapy was first employed with success in the treatment of typhoid fever and arthritis, both acute and chronic. The author has used it chiefly in cases of chronic intoxication from some focus of infection which cannot be located or removed. The toxins may give rise to arthritis, myositis, neuritis, or iritis, depending upon the organ whose resistance is below normal; but if the focus can be attacked and the toxins neutralized, benefit will follow.

Several cases are given, showing remarkable improvement following non-specific protein therapy. The cases cited are: (1) infective arthritis; (2) neuritis; (3) toxic iritis; (4) neuroretinitis; (5) bronchial asthma. The protein used was typhoid bacilli in doses ranging from five million to fifty million for the first intravenous treatment. As high as one-hundred million were given in subsequent treatments. The injections were followed by rigors, hyperpyrexia, etc. The results were very good.

The author advises against the indiscriminate use of this therapy, emphasizing the importance of selecting the cases. The criterion for forming such judgment should be evidence of general as well as of local toxic absorption. The best results were obtained



in cases showing general symptoms of malaise, irregular attacks of mild pyrexia, sweating, palpitation, etc., the most striking results being observed in those cases in which there were periodic attacks.

C. M. ANDERSON.

PEET, M. M.: The problem of Nutrition and a Satisfactory Method of Feeding in High Intestinal Fistulas. *American Journal of Medical Sciences*, Dec., 1919, clviii, No. 6, p. 839.

The method recommended is to supply sufficient calories in small quantities of food introduced through a very small rubber catheter lubricated with olive oil, and inserted for several inches down the distal loop of the fistulous opening. It is important not to insert the catheter more than three or four inches as this will cause a back flow. The food should be fluid and warmed to body temperature. Three or four ounces should be introduced every hour during the day and at three-hour periods during the night. The tube may be inserted at each feeding or left *in situ*. The fluid must flow slowly by gravity; a height of six inches is usually sufficient. Peptonized milk may be given freely. Partially digested raw eggs, meat juice properly strained, 5 per cent glucose, and whiskey may be added. Farinaceous fluids are helpful. If bile escapes from the upper loop some of it should be collected and introduced with the feedings. In threatened acidosis alkalis may be introduced.

A. T. MAYS.

HUNTINGTON, E.: Air Control and the Reduction of the Death Rate After Operations. *The Modern Hospital*, Jan., 1920, xiv, No. 1, p. 10.

It has been found by a study of the records of two of the large Boston hospitals for the past few years, together with the weather conditions prevailing during that time, that all kinds of ailments show a surprisingly close correlation with temperature, humidity, and variability. Different types of disease, however, respond differently. For surgical operations the best condition is high humidity, 80 per cent or more, directly after operations, and moderate humidity.



about 60 per cent, at a temperature of 64° F. (17.78° C.) a few days later. Such conditions can easily be produced artificially. This would probably cause an improvement in the results of operations in not less than 20 per cent of cases. For such an achievement the world might willingly pay millions of dollars.

Two means of humidification are suggested: (1) blowing warm air through a shower spray, (2) a cheaper method, suspending cloths, as if they were wicks, in pans of water with the upper part of the cloths spread out back of radiators.

Whatever method is used, it must be remembered that if air is to be comfortable and healthful it must be comparatively cool. A temperature of 65° F. (18.33° C.) and a relative humidity of 70 per cent as in spring and fall, is agreeable to people who require a temperature of at least 70° F. (21.11° C.) when the air is dry, in winter. Variability as well as humidity is needed.

While our knowledge of the whole subject is as yet imperfect, the evidence is overwhelming to the effect not only that the human organism is amazingly sensitive to slight atmospheric changes, but also that health could be much improved by proper humidity.

B. V. H. ANTHONY.

BRAM, I.: Course and Prognosis of Exophthalmic Goiter. *The Archives of Diagnosis*, January, 1919, xi, No. 3, p. 177.

Among a large number of collected cases death occurred in 11.8 per cent from Graves' disease alone, taking place from six months to six years after the onset. Fifty per cent died within eighteen months. Indirect causes raise the mortality to 18 or 20 per cent, and consist in the following: (1) heart-failure or loss of compensation; (2) tuberculosis; (3) insanity; (4) myxedema (may be superimposed); (5) cachexia strumipriva (result of removing the entire gland); (6) tetany (parathyroid removal); (7) diabetes mellitus.

IMPORTANT FACTORS CAPABLE OF INFLUENCING THE COURSE AND PROGNOSIS.—I. *Intrinsic* (those which exist directly or indirectly within the patient).—(1) Age and sex (more severe symptoms in younger patients and in males).

(2) The previous condition of health and the recuperative power of the organs and structures of the body.

(3) A markedly depraved digestive system impedes improvement.

(4) Effects on the cardiac myocardium are soon evident in the presence of tachycardia.

(5) Involvement of the nervous system—insomnia, vesicle and gastro-intestinal neurosis, and psychic change.

(6) The severity and duration of the morbid process.

(7) The presence or absence of complications.

(8) The social condition of the patient.

(9) The coöperation of the patient.

II. *Extrinsic*.—(1) *Early Diagnosis: Signs and Symptoms in Order of Appearance*.—There is a gradually increasing feeling of weakness in the calves of the legs, and a gradual loss of weight and strength. Precordial distress and palpitation are noted on exertion. The collar becomes tight and there is a sense of thickness over the front of the neck. There is a disturbance of mental power. A stare appears in the eyes, then bulging. Tremor of the outstretched fingers is noted.

(2) *Treatment—Shall it be Surgical or Non-surgical?*—(a) *Surgical*.—The surgical mortality was formerly 20 per cent and is now 4 or 5 per cent. Improvement is almost always short lived, followed by a return of symptoms. Pressure symptoms are relieved.

(b) *Non-surgical*.—Under proper medical attendance, a proper social atmosphere, the right dietetic, hygienic, medicinal, psychotherapeutic and other measures applied for the required length of time will, with few exceptions, cure every case of exophthalmic goiter.

(3) *Duration and Treatment*.—Cases of two or three months' duration usually require the same duration of treatment. Cases of from one and one-half to two years' duration show a habit of hyperexcitability of the circulatory and nervous systems, and some damage to organs and tissues, and will require from one to two years' careful and rigid treatment. Advanced cases with impending loss of compensation and marked emaciation are difficult to handle, for the cardiac are greater than the thyroid phenomena.

(4) *Environment*.—Preferably keep the patient at home. Strict individualization is to be observed, provided a perfect harmony can be obtained; if not, sanitarium or hospital must be resorted to.

(5) *Other Factors*.—Patience, tact, forbearance, diplomacy.

kindness modified by an unyielding firmness, a sympathy not over-indulgent, optimism, a funny story, a sincere hearty handshake on greeting and leaving the patient are all forms of psychotherapy and make for improved nerves, sound sleep, healthy appetite, good digestion, rapid improvement, and favorable prognosis.

L. B. ECKERSON.

MOSCHOWITZ, ELI: Hypertension: Its Significance, Relation to Arteriosclerosis and Nephritis, and Etiology. *American Journal of Medical Sciences*, Nov., 1919, clviii, No. 5, p. 668.

Hypertension is a symptom, not a disease. Any deviation from the normal state of arterial tension is a condition of decompensation of the circulation. The subjective and objective phenomena of decompensation represent a progressive process, and every persistent hypertension, unless complicating facts are introduced, results in graver evidences of decompensation, as shown by the clinical picture of cardiac insufficiency. Treatment will, in a great number of cases, restore compensation up to a certain point. The subjective improvement does not always correspond to the objective, and vice versa. The majority of the "essential" cases of hypertension will eventually show signs of advanced kidney or arterial disease, and these later conditions are the result. The conventional classification—arteriosclerotic, nephritic, essential—is clinical and teleological, and not etiological. The classification is incomplete; it should include in addition the cerebral, cardiac (coronary), and aortic types. Evidence shows that arteriosclerosis, with the exception of the "de-crescent" form, is the result of hypertension. The pathologic changes in the kidney of Bright's disease are the result rather than the cause of hypertension. A case of proved contracted kidney is given, in which the urine was free from albumin except during faulty circulation, and blood-pressure was normal. The albuminurias associated with cardiovascular disorders are rather the result of static circulatory changes within the kidney than of direct injury of the kidney parenchyma. A hypertension may occur with normal, or practically normal, kidneys.

A. T. MAYS.



WHITTEMORE, WYMAN: A Series of 100 Consecutive Acute Empyemata. *Boston Medical and Surgical Journal*, Nov. 13, 1919, clxxxi, No. 20, p. 575.

The author reports 100 cases occurring in his practice during twenty months. Many cases have been operated upon so recently that it is impossible to report the final results as to how many became chronic. Nine cases were operated upon by the old open rib resection method. This method gives a 20 per cent mortality. Ninety-one cases were operated upon by three different technics. The attempt was made to get the lungs to expand and thereby to do away with the empyema cavity, and, secondly, to render the pleural cavity sterile. The methods used were (1) Dr. Lilienthal's operation, (2) the Carrel-Dakin technic, (3) the closed suction method. Fourteen were operated upon by the first technic, 12 of whom got along excellently. The shortest stay in the hospital was eighteen days, the longest four weeks. One death took place in this group. In the Carrel-Dakin group 11 cases were operated upon, and the results were not so brilliant. The best case healed in three weeks. When finally healed all but one had a considerable cavity, and only one was sterile. Eight finally recovered, the shortest time being from six to seven weeks. Two did not heal even after several months. One died. The remaining 66 were operated upon by the closed air-tight method. The principles of this method are: early operation, allowing the fluid to escape slowly, sterilization of the pleural cavity by Dakin's solution, the suction of the pleural cavity, the prevention of a considerable pneumothorax. The operation was always done under local anesthesia. Of these cases 54 recovered without further operation; 6 needed a secondary operation, and quickly healed. Two became chronic and left the hospital with tubes. Four cases died, 3 of which were in no condition to be operated upon. Only 1 case returned to the hospital up to the time of the report, and he recovered after the use of Dakin's solution without further operation. In the whole series of 100 cases only 6 patients died, 2 of whom the author is convinced should not have died.

In conclusion emphasis is laid on the importance of early operation by means of a closed air-tight suction technic, under local anesthesia, followed by the intelligent use of Dakin's solution.

M. M. BANOWITCH.



ALLEN, F. M., WISHART, M. B., AND SMITH, L. M.: Three Cases of "Renal Glycosuria." *Archives of Internal Medicine*, Nov. 15, 1919, xxiv, No. 5, p. 523.

Three out of 40 cases of glycosuria referred to the diabetic service of U. S. Army General Hospital No. 9 were found to represent examples of so-called renal glycosuria. From a study of these cases the authors conclude that such cases are not as rare as was once supposed. The etiology was unknown in 2 of the 3 cases. The history in the third case suggested that trauma was either the primary or at least the exciting cause. There was no indication of nephritis or renal abnormality in any of the 3 cases, except a slightly subnormal phenolsulphonephthalein elimination. The apparent absence of harm in all 3 patients on unrestricted diet with continuous sugar excretion agrees with the favorable prognosis of this condition, given in the literature. The only disturbance of health is that resulting from the severe restrictions of diet necessitated by any attempt to stop the sugar excretion. The sharp contrast with true diabetes in this respect is of theoretical as well as of practical interest. No fixed relations were observed between sugar in blood and in urine. The renal excretion does not necessarily serve to maintain a low level of blood-sugar. The output is not always higher with high than with low blood-sugar. No fixed relation was observed between sugar and water elimination. The sugar excretion seems to be determined by the supply of available carbohydrate, especially preformed, but also to a lesser degree by the potential carbohydrate of protein. The fat ration and total metabolism, which are important in true diabetes, are probably without influence here. No abnormal tendency to acidosis was observed. The excreted substance in 1 of the 3 cases seemed to be an unknown sugar, distinguished from glucose by the absence or incompleteness of fermentation. The nature of so-called renal glycosuria is not established. Frank's hypothesis of a high plasma sugar did not hold in these cases. It is not yet proved that the abnormality lies in the kidney, or that it consists merely in a lowering of the normal threshold of sugar excretion. It is possible that cases differ in kind as well as in degree, and that a group of anomalies have heretofore been included under this name.

T. HOWARD.

MACLEOD, J. J. R.: The Diagnosis of Acidosis. *The Journal of Laboratory and Clinical Medicine*, March, 1919, iv, No. 6, pp. 315-29.

It has been shown by recent investigations that the excretion of acetone bodies cannot in itself be considered a reliable indication of impending acidosis. Diagnosis must depend, not upon the detection of certain acids, but upon the effects produced by the accumulation of acids in general in the organism.

It was found by experiments on animals that intravenous injections of acids caused a marked diminution in the  $\text{CO}_2$  content of the blood, resembling that of patients with diabetic coma. Theoretically this method is sound, but the technic of estimation is imperfect.

Haldane and Priestly discovered that the percentage of  $\text{CO}_2$  in the alveolar air of normal individuals at atmospheric pressure is remarkably constant, and Kregg found that the amount of free  $\text{CO}_2$  in the arterial blood is nearly the same as that in the alveolar air. A diminution in the alveolar  $\text{CO}_2$  was found in diabetic patients in cases of threatening coma, but also in cases of other diseases, and in normal individuals as a result of deficient oxidation in the tissues.

The electrolytic test has also been tried. The electric charge of  $\text{H}^+$ -ion and all metals is positive, that of  $\text{Cl}^-$  and all acid groups is negative. They would therefore attract and neutralize each other. Consequently the presence of free  $\text{OH}^-$  ions (denoting positive, negative charges) would be a measure of alkalinity, as perfect neutrality would ensue where  $\text{H}^+$  and  $\text{OH}^-$  ions exactly balance each other.

The  $\text{C}_\text{H}$  (hydrogen-ion concentration) may be tested electrically by "measuring the voltage or electric force set up in a battery of which one electrode is pure hydrogen gas in intimate contact with the solution whose  $\text{C}_\text{H}$  we desire to measure, and the other electrode is one of known voltage."

The colorimetric method is much simpler, and consists in titrating solutions for acidity by indicators, which change in tint in proportion to the  $\text{C}_\text{H}$ . As the exact  $\text{C}_\text{H}$  at which the indicators change varies with the indicator, this method is not as exact as the electrical test. When the colorimetric method is used to test blood, it is necessary to remove the pigment and protein, as these interfere with the reaction.

The  $\text{C}_\text{H}$  of blood is nearly always constant. Even in severe

cases of ketosis, an increase in  $C_H$  is perceptible only in the final stages of the illness, and denotes a condition incompatible with life. To detect earlier stages it is necessary to study the mechanism by which neutrality is maintained in the organism. Even a trace of acid added to water changes the  $C_H$ , but considerably more is required to produce a perceptible change in blood, which evidently contains something which soaks up the added H-ions. This is called the "buffer action" or "tampon action" of the blood, and is

$$\text{expressed by the ratio: } \frac{H_2CO_3}{NaHCO_3} = \frac{1}{20}$$

When the ratio of 1/20 is changed a disturbance of metabolism is denoted. Acidosis may be detected when the proportion is greater than 1:20. However, this reaction is influenced by respiratory ventilation, and by the general excitability of the nervous system and heart action. "Therefore, the alveolar  $CO_2$  can serve as an accurate index of the acid base equilibrium of the blood only under certain controlled conditions." The determination of the ability of the blood to absorb  $CO_2$  is probably the most practical method of measuring the acid neutralization, *i. e.*, the functioning power of the acid buffer, or the alkaline reserve. However, it fails to take account of the total reserves of the body. These reserves consist in the alkalis of the plasma, the alkalis of the corpuscles, the proteins of the blood, and the alkalis and proteins of the tissue-cells. Only the blood can be tested. There is therefore no reliable method of measuring the buffer action of the body as a whole.

Another plan is to measure the acid excretion by way of the urine. Acids are excreted: (1) as acid salts, (2) as salts of ammonia, (3) as free acid. The only satisfactory test must measure all three forms. To measure the amount of free acids and acid salts it is necessary to titrate the urine with standard alkali until its  $C_H$ , which is normally on the acid side of neutrality, is brought to the level of that of blood. Phenolphthalein may be used. By adding to this the amount of ammonia excreted—measured by Folin's new permutit method—one obtains the total urinary acid secretion.

Another method for gauging the alkaline reserve consists in calculating how much alkali can be added to the organism without causing the urine to give an alkaline reaction. This is the best test



of acidosis at present available in routine clinical work, and has been found of particular value in the diagnosis of acidosis accompanying certain forms of renal disease (chronic interstitial nephritis).

BECK, HARVEY G. AND McLEAN, GEORGE: The Clinical Significance of Achylia Gastrica. *Southern Medical Journal*, Oct., 1919, xii, No. 10, p. 594.

The authors have found this symptom in 11 per cent of their gastro-intestinal cases, and reached the following conclusions with regard to its etiology:

- (1) Focal and systemic infections are unquestionably concerned in the etiology of achylia.
- (2) Endocrinous disturbances associated with achylia are the result of chronic infections and not the cause of achylia.
- (3) Nervous or reflex disturbances *per se* are not etiological factors.
- (4) Exclusive of carcinoma of the stomach and advanced stages of chronic interstitial gastritis, gastro-intestinal disturbances are either incidental or secondary to achylia.
- (5) Diseases of the cardiorenal system and of metabolism occur coincidentally with chronic infections and play an insignificant rôle in the causation of achylia gastrica.
- (6) Excessive indulgence in alcohol and tobacco without focal infections will apparently not produce achylia. The excessive use of coffee and tea may produce it.

M. KESCHNER.

GRUBER, CHARLES, M.: The Significance of Epinephrin in Muscular Activity. *Endocrinology*, April-June, 1919, iii, No. 2, p. 145.

Adrenalin injected intravenously in small doses increases the height of muscular contraction, and in five minutes or less restores the increased threshold stimulus, caused by fatigue of the nerve-muscle or muscles, as much as does rest for from one to three hours. Epinephrin, when injected into the perfusion fluid of fatiguing muscle, causes vasoconstriction, and increased height of muscular



contraction, the latter depending upon the strength of adrenalin injected. The inference is drawn that this is brought about by a specific effect upon the muscle in eliminating fatigue, and where the nerves are intact, by bettering the circulation through dilatation of the vessels. Since, in perfused excised muscles, the betterments are so marked, and vasoconstriction in these preparations apparently so striking, epinephrin exerts some specific action on fatigued muscle, other than that due to mere circulatory changes.

L. C. JOHNSON.

LAMB, A. R.. The Flint Murmur. *The Medical Clinics of North America*, Sept., 1919, iii, No. 2, p. 467.

Two cases of aortic insufficiency are presented; in one, the etiological basis is rheumatic fever, and in the other it is syphilis. A presystolic murmur was heard in both cases and the diagnosis of a probable Flint's murmur was made. Postmortem examinations revealed in part a true mitral stenosis in the case with rheumatic etiology, while in the case showing a Wassermann 4 plus the mitral valves were normal in appearance.

Lamb points out that in the differential diagnosis between true mitral stenosis and a Flint murmur, the presence of a thrill and the character of the murmur is of little value. Of greater value, and favoring a Flint murmur, is the presence of a Corrigan pulse and the absent tapping systolic impulse and snappy first sound. The etiology should give valuable information, for rheumatic fever rarely attacks the aortic valve without causing some damage to the mitral valves, whereas in syphilitic aortic disease with insufficiency the mitral valve is most often found free of any involvement.

H. WOLFER.

MEAKINS, J.: Prolongation of the "S-T" Interval of the Ventricular Complex as Shown by the Electrocardiograph. *Archives of Internal Medicine*, Nov. 15, 1919, xxiv, No. 5, p. 489.

Meakins reports on a series of 26 cardiac and 10 diabetic patients in whom a prolongation of the "S-T" interval on the electrocardiographic tracings was found to be present. A study of these cases

showed that this phenomenon was intimately associated with left-sided preponderance in the cardiac group. In the diabetic group this prolongation was more apt to be in evidence when the patient was on a low calory diet, and became less marked when the diet was more liberal. Most of the patients complained of various degrees of precordial pain, sometimes amounting to typical angina, in spite of which none of them died from cardiac failure, although many of them had been under observation for some years. From a study of these patients Meakins also concludes that prolongation of the whole ventricular systole may occur without definite evidence of injury to the bundle of His or its branches, and that prolongation of the Q-R-S interval occurs with left-sided hypertrophy.

T. HOWARD.

HYATT, EMERY G.: The Action of Alcohol on the Heart and Respiration. *The Journal of Laboratory and Clinical Medicine*, Oct., 1919, v, No. 1, p. 56.

The varied effects on the heart and respiration were obtained when alcohol was administered to unanesthetized animals whose spinal cords had been severed previously (the day before), at about the level of the eleventh thoracic vertebra.

(1) When the drug is given by mouth there is a rapid rise and an immediate return to normal. This is due to local action.

(2) When the drug is given intravenously the results are as follows: (a) When it is given gradually in quantities sufficient to kill in from one to two hours, there is no effect until just before death, when a rapid fall of pressure takes place. (b) When it is given rapidly there is a sudden fall, followed by an immediate return to normal. There is no effect if the vagi are cut.

(3) When it is given by stomach, introduced by means of a stomach tube, there is no effect.

(4) When alcohol is introduced without excitement intravenously into the normal dog, there is no stimulation of the heart or respiration.

C. M. ANDERSON.

MACINTYRE, CAPT. H. R.: Tuberculosis as a Causative Factor in Disordered Action of the Heart. *Canadian Medical Association Journal*, March, 1919, ix, No. 3, pp. 229-237.

It was noticed in No. XI Canadian General Hospital during the winter 1917-18, that many medical history sheets showed that the patient had been at some other hospital because of disordered action of the heart. In a number of these cases it was possible to demonstrate early apical tuberculosis clinically and by the use of the roentgenograph and of the subcutaneous tuberculin test.

Many patients, youths of nineteen to twenty-one, showed cough, loss of weight, general weakness, pallor, evening rise of temperature, and a rapid, irritable heart—a clinical picture of early tuberculosis with no sputum or chest manifestations. In these cases, *x-ray* examination revealed mediastinal glandular enlargement. In some cases the subcutaneous tuberculin reaction was sharply positive, and they were diagnosed as “tuberculous mediastinitis” and dealt with accordingly.

The author's investigations had to do with 200 cases of unselected disordered action of the heart (at Colchester). The tuberculin test and roentgenographic examination were used to determine whether or not it was possible to demonstrate any relation between the disordered action of the heart, mediastinal glandular enlargement, and a positive tuberculin reaction.

One c.c. of 1-1,000 dilution of old tuberculin (equal to 1 mg. O. T.) was injected subcutaneously into the inner aspect of the upper left arm. The results showed:

Positive reactions	Negative reactions	Local reactions only
23 (11.5 per cent)	175 (87.5 per cent)	70 (35 per cent)

There was a noticeable slowing of the “pulse at rest.” In many instances it fell below any previously recorded pulse-rate.

The general reaction consisted only in restlessness, sleeplessness, and headache, and yielded little new information.

There was drowsiness on the day following the injection, probably related to the low pulse-rate. The reaction was on the whole positive with a rise of less than 1° F. (.55° C.).



In a later series of 100 cases the results showed:

Positive reactions	Negative reactions	Local reactions only
9 (9 per cent)	91 (91 per cent)	27 (27 per cent)

The author noted a "lower percentage of local reactions in this series as compared to that at Colchester. In cases of disordered action of the heart, on the whole, the local reaction appears to be present itself later than in cases seen in a chest ward. In cases in a chest ward the local reaction usually reaches its height within the first twenty-four hours, except in the more latent cases." . . . Of the 9 cases that gave a definite positive reaction, 7 presented a local reaction with signs and symptoms referable to the heart, and 2 a focal reaction with signs and symptoms referable to the chest.

"Of the 7 with signs referable to the heart, 7 presented tenderness over the dorsal spines (1 over second and third, 6 over third and fourth). Two complained of precordial pain, 5 of vertigo where it had not existed previously. Five showed a 'pulse at rest' lower than ever existed previous to injection.

"Of the cases with signs referable to the chest 1 complained of pain in the right clavicular region, smothering sensation, and an increase in cough and sputum. The chest showed right apical impairment posteriorly, harsh inspiration with prolonged and intensified expiratory murmur and more or less constant moisture in this region. The second complained of excessive cough following injection, and post-tussic moisture was elicited in the right apex. In both cases the 'pulse at rest' on the morning following injection was lower than had ever previously been known. . . .

"Of the 9 positive reactions 5 complained of drowsiness in the morning following injection."

The author draws the conclusions:

- (1) "In a percentage of unselected cases of disordered action of the heart (10.6 per cent of this series) active tuberculosis exists.
- (2) Apart from cases showing active tuberculosis, a still larger percentage (32.3 per cent of this series) show evidence of a previous and latent infection."

He does not draw any decisive conclusions as to whether or not the infection is the causative factor in this percentage of disordered action in the heart cases.



LEARY, ALFRED J.: The Relation of Oral Infection to Systemic Disease. *Boston Medical and Surgical Journal*, Nov. 20, 1919, clxxxi, No. 21, p. 611.

The author states that oral infection is more and more considered to be a cause of systemic disorders. The need of exact diagnosis in the search for the seat of infection is essential, but very often baffling in the attempt to localize the hidden focus exactly. He quotes Nodine as stating that 95 per cent of teeth in which the pulps have been devitalized and in which an effort has been made to fill the root-canals, have incomplete or no root-canal fillings. From 75 to 80 per cent of these cases have apical abscesses or infections radiographically discernible. Of the 5 per cent with perfect root-canal fillings many yield bacterial cultures. Focal infection from the ends of the roots of devitalized teeth is the most certain and frequent underminer of health.

Oral foci may cause secondary infections by way of the capillary or lymph systems. Absorption is most apt to be caused by blind, acute, or chronic abscesses, but may also come from pyorrhea pockets, diseased gums, or mucous membrane lesions.

Oral abscesses are a common infection and their great importance must be realized in relation to secondary systemic disease. While there are other foci responsible, such as tonsils, sinuses, gastro-intestinal tract, and so on, the teeth are the seat of more infections than is the case with any other focus, and many cases are reported in current medical literature which have been cured by the extraction of diseased teeth. Among these are found gall-bladder infections, chronic appendiceal inflammation, chronic arthritis, gastric and duodenal ulcers, and many others. The author reports a severe case of acne of the face and shoulders which cleared up after the extraction of diseased teeth.

Special emphasis is laid on the fact that most pulpless teeth cause chronic inflammatory processes in the alveolar processes of the jaw, with slight local manifestations, but none the less responsible for systemic disease.

The conclusion is that all mouth conditions should receive most scientific attention and that no obscure disease can be regarded as well treated unless the teeth are studied and put in perfect condition.

M. M. BANOWITCH.

HOWARD, C. P.: Functional Diagnosis of Polyglandular Disease in Acromegaly and Other Disturbances of the Hypophysis. *American Journal of Medical Sciences*, Dec., 1919, clviii, No. 6, p. 830.

Experimental data on 5 cases of hypophyseal disease and 15 normal controls are submitted. A comparison is drawn with the investigation of Carl Csépai in 1914. The author's conclusions are:

(1) A decrease in the sugar tolerance, in the presence of other disturbing symptoms of pituitary function, justifies a diagnosis of increased activity of the pars intermedia.

(2) The adrenalin conjunctival test may be positive in cases of dyspituitarism in demonstrating a hypofunction of the chromaffin system.

(3) The subcutaneous adrenalin test is of doubtful value.

(4) Both the conjunctival and subcutaneous pituitrin tests yield doubtful results.

(5) The symptomatology is not altered upon the internal administration of either the whole gland or the anterior or posterior lobes separately.

One of the cases showed a secondary hyperpituitarism from a greatly increased intracranial pressure, caused by a large sarcoma of the occipitoparietal lobe.

A. T. MAYS.

CLARK, L. P.: Is Essential Epilepsy a Life Reaction Disorder? *American Journal of Medical Sciences*, Nov., 1919, clviii, No. 5, p. 703.

By essential epilepsy is meant the disorder which is exclusive of the so-called organic epilepsies, and those with definite physical lesions, or dysfunctions of the viscera. It is viewed largely as a life reaction disease, or syndrome, occurring in particular types of individuals possessed of certain inherent or instinctive defects of character or emotional make-up. A large series of essential epileptics were studied as to their primary mental endowment before fits occurred. Nothing was found in mentality which was not found in

the frank and veteran epileptics. The character faults varied in amount and degree, in such potential states before seizures, but the defects marked pathological personalities portending a possible epilepsy in later life. The following variations are discussed:

- (1) The So-called epileptic character and development.
- (2) Causes of the epileptic fit.
- (3) Nature and meaning of the fit.
- (4) The rational deductions in care and treatment of epilepsy drawn from such a view-point and study.

A. T. MAYS.

HOWARD, TASKER: Meningo-encephalitis as the Only Manifestation of Mumps. Report of Three Cases. *American Journal of Medical Sciences*, clviii, No. 5, p. 685.

At Camp Lee, during an epidemic, there were 3 cases of mumps presenting cerebral complications, with absence of salivary gland involvement. Metastatic lesions are well known during mumps, and may appear without involvement of the salivary gland, as in these cases. The diagnosis was made for the following reasons:

- (1) The lesions occurred during an epidemic of mumps.
- (2) Two patients had never had mumps, while the third had been informed by his father that he had had the disease, although it was not within his recollection.
- (3) All had mild symptoms of meningo-encephalitis, relieved, or much ameliorated, by spinal puncture.
- (4) A Gram-positive diplococcus, supposed to be the causative organism, was recovered from 2 cases.
- (5) The spinal fluid, in each case, presented a moderate pleocytosis, characterized by a predominance of mononuclear cells. The conditions with which we are familiar, which give this picture, are syphilis, sometimes tuberculous meningitis, encephalitis lethargica, and mumps.

Tests for syphilis in the case of two of the patients were negative; the third gave a positive Wassermann reaction, and repeatedly showed a gram-positive coccus in the spinal fluid. Tuberculous meningitis is ruled out in all these cases by the clinical course. Encepha-



litis lethargica was ruled out, there being no cranial nerve involvement and no palsies. There was also an absence of the increased tendon jerks which are almost uniformly present in the cases of this disease which have been observed. By exclusion, these 3 cases must be considered meningo-encephalitis caused by mumps.

A. T. MAYS.

STOKES, W. R., AND MALDIES, H. W.: Specific Treatment of Typhoid Fever. *Boston Medical and Surgical Journal*, Nov. 27, 1919, clxxxi, No. 22, p. 625.

The authors give an extensive review of the literature bearing on the specific and non-specific treatment of typhoid fever. They report three series of cases treated by themselves consisting of 31, 60, and 10 cases.

In the first series of 31 cases the dosage used was 10,000,000 bacteria given subcutaneously. The number of doses varied between 1 and 6. The average duration of the disease was thirty days, and cases receiving the first dose early, that is on the second, third and fourth day of the disease, showed no tendency toward decrease in duration. The mortality was 5 or 16.1 per cent.

The second series was treated in 1913 and consisted of 60 cases. Doses beginning with 50,000,000 were used, and were increased to 100,000,000 and 250,000,000 at intervals of several days. The record cards relating to these cases were lost, but the impression gained was that the duration of the disease was shortened in a fair number of cases, and a few showed rapid decline to normal after the second dose had been given.

The third series, that of 10 cases, was treated in 1916. The intravenous route was employed. Sensitized typhoid vaccine, made from Rawling's strain, was used. Immune serum was added to the vaccine until all agglutinations were saturated by the immune serum. Of these 10 cases, 6 were treated before the tenth day and showed positive blood cultures and Widal reactions. Four were treated after the tenth day, the Widal being positive but the blood cultures negative. In 5 of the 6 early cases treated, two injections were given at intervals of four days, and in 3 of these the disease seemed to have been aborted. In the other 2 the temperature dropped to normal in eighteen days and remained so. In the other early case one injection



was given and the case followed the regular typhoid course. Doses of 300,000,000 were used. In the 4 late cases the vaccine did no harm, but no benefit was seen.

One of the authors (Stokes) prepared a curative serum by injecting hogs with bouillon cultures of typhoid, and this serum had an agglutinative titer of 1/45,000. Twenty-three cases were treated with this serum in all stages of the disease, with two deaths, one resulting from otitis media, the other from intestinal hemorrhage. Of the other 21 cases, 15 seemed to show favorable results from the use of serum.

The authors conclude: (1) That mortality—usually about 10 per cent—can be reduced by specific and possibly by non-specific treatment; (2) that vaccine and curative serum, either alone or, in combination, should be tried out; (3) that large numbers of cases should be treated by various methods and each group compared with other groups for statistical study of fatality, complications, relapses, height, and duration of fever; (4) that better results are obtained from large doses and from the early institution of the treatment.

M. M. BANOWITCH.

YOUNG, EDWARD L.: Silent Renal Calculi. *Boston Medical and Surgical Journal*, Nov. 13, 1919, clxxxi, No. 20, p. 573.

The author undertook this study in order to determine, (1) how frequently silent renal calculi occur; (2) what damage, if any, occurs to the kidney; (3) how long a stone, known to exist in the kidney, can be left without serious damage to the kidney; and, (4) whether damage can occur without showing signs in the urine.

For his material he looked over the records of almost 4,000 autopsies done at The Massachusetts General Hospital since 1896. Cases showing stones were studied macroscopically and microscopically as to the condition of the kidneys and this data correlated with the clinical symptoms and urinary findings. He finds only 45 cases showing stone in the kidney, or ureter, or both. Of these, 8 were operated on and known to have stone or renal damage. Thirty-seven were discovered in patients in the hospital for other conditions and had nothing to do with the cause of death. There was only 1 case with completely negative history and urinary findings, and normal kidney, both macroscopic and microscopic; but there were 4 cases with-

out symptoms and with negative urine; 6 cases at autopsy were found to be without any damage to the kidney, and 15 with damage so slight as to be negligible. Of 2 patients with stones in the calices known to be present for six years, and who had had repeated attacks of renal colic, 1 had a normal kidney, the other almost a negative kidney.

Ureteral stones do more damage than do those of the pelvis or calix, and a small ureteral stone can do as much damage as a large one. Pus may be present during life without evidence of infection or damage being found at autopsy. There is no standard by which to decide which stones should or should not be operated upon. Ureteral stones almost always damage the kidney and should therefore be removed as early as possible.

M. M. BANOWITCH.

WARFIELD, L. M., AND SMITH, FRED M.: Studies on Irritable Heart. III. The Value of Exercise in the Diagnosis and Determination of the Fitness of the Irritable Heart For Military Service. *Journal of Laboratory and Clinical Medicine*, Nov., 1919, v, No. 2, p. 81.

The simpler types of setting up exercises were used at first, then graded exercises, and short hikes, from two to five miles long. Out of 142 men examined, three large groups were found: first, those in whom no cause for irritable heart could be found; second, those with irritable heart with toxic or exophthalmic goiter as a basis; third, irritable heart in which a diagnosis of active pulmonary tuberculosis was made. Results further showed:

- (1) Irritable heart is not uncommon among young civilians.
- (2) The syndrome of irritable heart is found in a variety of diseases.
- (3) Army training should begin with graded exercises.
- (4) Men with incipient irritable hearts are easily broken down by military training.
- (5) Graded exercise is valuable in sorting the fit from the unfit and in bringing to light suspected cases of incipient tuberculosis.
- (6) Cases of irritable heart are not fit for general or limited military service.

C. M. ANDERSON.

SHATTUCK, G. C.: Medical Aspects of Wounds of the Chest in War. *American Journal of Medical Sciences*, Nov., 1919, clviii, No. 5, p. 629.

The necessity of close coöperation between physician and surgeon is illustrated by 500 cases collected while the author was in army service. The problems of interest were especially seen at the Casualty Clearing Station. The importance of routine treatment and careful handling of preöperative and postoperative cases was noted, as as well as the necessity for exact diagnosis of probable intrathoracic lesions, and the selection and care of cases not operated upon. Pulmonary edema must be carefully safe-guarded. The time of transfusion, and contra-indications to the treatment, were carefully observed in the wards, while the surgeon's time was occupied in the operating room.

A. T. MAYS.

BENJAMIN, JULIEN E., AND HAVRE, SYDNEY J.: Further Observations on the Relation of Aortic Insufficiency to the Wassermann Test. *The Journal of Laboratory and Clinical Medicine*, Oct., 1919, v, No. 1, p. 47.

A report is made of 33 cases of aortic insufficiency unassociated with any other organic cardiac disease, from a clinical standpoint. These were obtained from examination of 44,018 recruits at Camp Riley, Kansas. Of the 33 cases only 11 per cent showed positive Wassermann reactions, while 57 per cent gave undisputed histories of rheumatism, 15 per cent gave questionable histories of rheumatism, and histories of frequent attacks of tonsillitis. Heretofore other careful observers have reported that from 60 to 84 per cent of cases of unassociated aortic insufficiency gave positive Wassermann reactions.

C. M. ANDERSON.

BARKER, M. H.: Entertaining Sick and Convalescent Children in the Hospital and at Home. *The Modern Hospital*, Jan. 1920, xiv, No. 1, p. 15.

Lack of diversion is often the cause of irritability in convalescent children. Easy handwork, stories, and games in bed or on a chair



are of great aid to speedy recovery. The trained nurse should have at her command certain devices to divert the children's attention, to stimulate mental activity, and to train the hands, in order to prevent the forming of bad habits of idleness.

It has been found advantageous in the Worcester City Hospital to give the nurses in training a one week's course under a kindergarten teacher, who shows them simple means of diverting and entertaining children. Dolls and toys may be fashioned from old boxes, paper, string, etc., and cost almost nothing. The depressing effect of inactivity on both mind and body is thus overcome.

B. v. H. ANTHONY.

PICKEN, R. M. F.: Expectation of Life in Pulmonary Tuberculosis, With Special Reference to Pensions Assessment. *London Lancet*, July 19, 1919, pp.106-108.

The author calculated the percentage of surviving notified cases of tuberculosis (from 1910-1917) in age groups. He came to the following conclusions:

- (1) The expectation of life in tuberculous males of 30 years is on an average  $3\frac{1}{2}$  years.
- (2) That of cases in the early stage is  $6\frac{1}{2}$  years.
- (3) That of cases discharged from sanatoria as arrested is 14 years.
- (4) The normal expectation of life in males of 30 years in Glasgow is 30 years, or perhaps higher.
- (5) These data, applied to the assessment of soldiers and sailors discharged from service with pulmonary tuberculosis, justify a minimum assessment of pension of 50 or 60 per cent disability even in temporarily arrested cases.
- (6) Actively progressive cases should be assessed at 100 per cent disability.
- (7) All other cases—chronic fibroid, etc.—should be assessed at 70 or 80 per cent disability.

## SECTION ON

### LABORATORY AND RESEARCH

LEVIN, W.: The Incidence of Syphilis Among White and Colored Troops as Indicated by an Analytical Study of the Wassermann Results in Over Ten Thousand Tests. *The Journal of Laboratory and Clinical Medicine*, Nov., 1919, v, No. 2, p. 93.

The author states that among the troops stationed at Camp Funston and The Medical Officers' Training Camp at Fort Riley the Wassermann tests showed 13.8 per cent of the white, and 24.1 per cent of the colored soldiers to be syphilitic. He estimates that the same, or probably higher, percentages of syphilitics exist among the white and colored civilians of ages between twenty-one and thirty-one, for statistics show that venereal disease is much more prevalent among civilians than among soldiers. He gives several tables to show that the national army men—drafted from the rank and file of our population—brought in more cases of venereal disease than existed among the regulars, or the national guards, or the Expeditionary Forces. Three hundred and fourteen of the syphilitics at Camp Funston had the disease before their arrival at the camp.

According to Levin's statistics, retinitis, iritis, cerebrospinal meningitis, various diseases of the spinal cord—probably largely complications of syphilis—are commoner among the colored soldiers. Similarly arthritis, osteomyelitis, endocarditis, nephritis, and urethritis—complications of gonorrhea—are from two to three times commoner in colored than in white individuals. Results based on special Wassermann tests indicate that cerebrospinal syphilis is more common among the white than among the colored troops.

C. M. ANDERSON.

McCONNELL, GUTHRIE: The "Delayed Negative" Wassermann Reaction. *The Journal of Laboratory and Clinical Medicine*, Oct., 1919, v, No. 1, p. 43.

The usual antigen employed for the Wassermann reaction is a plain alcoholic extract of tissue, generally beef or human heart. The author uses two antigens, one a plain alcoholic, the other a cholesterinized extract, the latter being by far the more sensitive. After adding the hemolytic serum the tubes are thoroughly shaken and then placed in a water bath or incubator for from one to two hours, the tubes being shaken every fifteen minutes.

By "delayed negative" is understood one in which the tube containing the cholesterinized antigen shows no hemolysis at the end of thirty minutes, but has completely cleared by the time of the following examination fifteen minutes later. With the plain alcoholic antigen there is no such delay.

The results show that it is advisable to take readings every fifteen minutes. By this method a certain number, about 1 per cent, will be found to give the so-called delayed negative reading. Of these, nearly three-quarters will give either a positive or a very suspicious history of venereal infection. The remaining quarter, which gives no history of venereal infection, and no clinical symptoms, are considered negative.

C. M. ANDERSON.

MASS, F. C.: Experimental Surgical Shock. V. The Treatment of the Condition of Low Blood-pressure Which Follows the Exposure of the Abdominal Viscera. *American Journal of Physiology*, 1919, 1, 86.

This paper reviews work undertaken to investigate under standard experimental conditions all the more important methods of treating a condition which exhibits the clinical signs of surgical shock, in order to determine the relative value of the methods. Exposure of the abdominal viscera was chosen as the method of producing shock which most resembled the production of shock presenting all the clinical signs. The methods of treatment are considered under the following heads: (a) general measures; (b) special measures; (c)

the use of drugs; (*d*) attempts to restore fluid volume. Under each heading are discussed in detail the various methods and their relative value. A summary gives too limited a view of the discussion, which has been admirably condensed to essentials by the author. In general, however, he concludes as follows:

*General Measures.*—The efficaciousness of heat and cold as treatments was corroborated. Warning is given against too much heat.

*Special Measures.*—Rebreathing was not found to be of importance.

*Use of Drugs.*—None of the stimulants or vasoconstrictors were found to be very effective.

*Restoration of Fluid Volume.*—Blood or blood-serum produced by far the best results. Colloidal solutions were the best artificial solutions used. In general the gelatin solutions produced a more favorable action than the acacia solutions, although some modifications of the latter produced as good or better results than the gelatin. Care must be exercised with both gelatin and acacia, as dangerous reactions may be produced with either.

W. H. EDDY.

ASADA, H.: Acidosis During Starvation. *American Journal of Physiology*, 1919, 1, 1.

Asada reviews previous work on the subject, calling attention to a decrease of alkalescence and a fall in  $\text{CO}_2$  tension reported in various starvation cases. The author utilized the Van-Slyke-Cullen method for the determination of alkaline reserve in experiments with 28 rabbits. Details of the analyses are reported and the following conclusions drawn:

(1) On the first and second days of starvation, the plasm bicarbonate in the arterial blood of rabbits showed a drop from the normal value. On the third day there was a second sharp fall, after which no change was noted until the ninth day. On the tenth day there occurred a third rather moderate fall, after which no further change took place until the end of life. Generally the arterial plasma of rabbits has 55 per cent volume of  $\text{CO}_2$ . The first fall is 5 volume per cent, the second about 10 and the third about 6 volume per cent.



(2) The amount of  $\text{CO}_2$  in the arterial plasma is influenced considerably by the condition of the animals. After one extraction of 10 c.c. blood from the carotid the acidosis seems to be conspicuously increased, since on second extraction the  $\text{CO}_2$  is always less than that of the first extraction on the same fasting day. In the moribund state a contrary result is obtained, i. e., the  $\text{CO}_2$  in the arterial plasma increases instead of decreases, due, the author thinks, not to bicarbonate but to accumulation of  $\text{CO}_2$  by failure of circulatory as well as respiratory functions.

(3) The rate of loss of body weight is subject to wide individual variations, which may or may not be influenced by the blood extraction. The animals averaged 14.5 days absolute fast and lost on an average 41.78 per cent of their initial weight. There is no demonstrable relation between the loss of body weight and the fall in the amount of plasma bicarbonate.

(4) Microscopically many organs showed cloudy swelling, vacuolarization and atrophy. There was invariably an intensive congestion in every glandular organ, but fatty degeneration was found in almost no case.

W. H. EDDY.

CHICKERING, H. T.: The Bacteriology of Secondary Pneumonia.  
*Boston Medical and Surgical Journal*, Dec. 11, 1919, clxxx.  
No. 24, p. 679.

The author reports the conclusions from studies made at Rockefeller Institute:

(1) Lobar pneumonia is almost always caused by the definite disease-producing types of pneumococcus.

(2) Secondary pneumonias are associated with a great variety of organisms, namely, pneumococcus, streptococcus, staphylococcus, *Bacillus influenzae*, *Micrococcus catarrhalis* and *Micrococcus flavus*, Friedländer's bacillus, and others.

(3) In primary lobar pneumonia it is unusual to find more than one organism in the lungs in fatal cases. With the secondary pneumonias it is not uncommon to find two or more.

(4) The types of bacteria and their occurrence percentage in

secondary pneumonia compare closely with those of the bacteria residing in the nasopharynx.

(5) The determination of the bacterial flora in the normal individual's mouth depends upon a multiplicity of factors. Ordinarily they do no harm. But when the resistance is temporarily lowered they produce lesions, and in the presence of an epidemic they may assume a virulent character and are able to cause what is apparently a primary pneumonia.

(6) These studies have a clinical bearing on the management of the individual patient. More attention should be paid to the hygiene of the upper respiratory tract, such as cleanliness of the nasopharynx, suppression of congestion of the mucous membrane of this region, and checking of the cough.

M. M. BANOWITCH.

BARBER, M. A.: A Study by the Single Cell Method of the Influence of Homologous Antipneumococcic Serum on the Growth Rate of Pneumococcus. *The Journal of Experimental Medicine*, Dec. 1, 1919, xxx, No. 6, p. 569.

After describing various experiments with immune horse serum in hanging drops and in test-tubes and experiments *in vivo*, the author arrives at the following conclusions: Under the conditions stated pneumococci grow as readily in the serum of horses highly immunized to the homologous organism as they do in normal horse serum, and the rate of growth is not appreciably diminished.

This failure of immune serum to affect the growth rate is not altered when fresh rabbit blood, fresh human blood, or rabbit blister fluid is added in order to supply any hypothetical complement which might be lacking. Immune horse serum injected intravenously into rabbits, or intraperitoneally into mice, has not been shown to acquire the property of killing pneumococci or inhibiting their growth. Experimental evidence indicated that in the peritoneal cavity of the passively immunized mouse the growth of extracellular pneumococci continued at apparently the normal rate until the bacteria are engulfed by the phagocytes.

H. M. FEINBLATT.

HADEN, R. L.: The Bacteriology of Mumps. Report of Findings at Camp Lee. *American Journal of Medical Sciences*, Nov., 1919, clviii, No. 5, p. 698.

Twenty-five blood cultures were made in dextrose and plain infusion bouillon from 18 cases. Two resulted in contamination. Nineteen were sterile. Four cultures were made from 3 different patients and showed a small Gram-positive diplococcus. The growth was very slow. The organism appeared in forty-eight hours, when transferred to blood-agar plates. In another case the blood culture was reported negative, but the same diplococcus was found in an inguinal gland which had become swollen. The spinal fluid of another case demonstrated the diplococcus in direct smears.

A. T. MAYS.

CORPER, H. J.: The Cultivation of Recently Isolated and Laboratory Strains of Human Tubercle Bacilli on Artificial Media. *American Review of Tuberculosis*, Oct., 1919, iii, No. 8, p. 461.

After a great deal of experimentation with many types of media, the author has come to the conclusion that there is a distinct difference in the growing ability between different strains of human tubercle bacilli freshly isolated from the sputum, and those artificially cultivated for long periods on media prepared by adding various nutriments (beef extract, peptone, egg, milk, tissue, etc.), to a basic medium composed of agar, ammonium phosphate salt and glycerol.

Human tubercle bacilli artificially cultivated for about one year grow well upon media containing, besides the above basic constituents, any of the following: beef extract and peptone, defibrinated rabbit's blood, egg and ground-up tissues (testes, liver and brain), and sterilized by inspissation. The addition of cow's milk or sodium caseinate has no appreciable effect upon growth, while sodium nucleinate and yeast nuclein have an effect, although this is not marked.

Human tubercle bacilli, recently isolated from the sputum, grow more sparsely on these media than do those artificially cultivated for long periods, and growth is obtained only on a few of the media.



especially on those containing egg and rabbit's blood. In the author's series, a few strains of recently isolated cultures failed to grow on all the media.

C. A. SCHMID.

BROWN, J. H., AND ORCUTT, M. L.: Dairy Infection with *Streptococcus Epidemicus*. *The Journal of Experimental Medicine* Jan. 1, 1920, xxxi, No. 1, p. 49.

A milk-borne streptococcus epidemic occurred in the vicinity of Boston, in February, 1917, and was traced to a dairy producing a high grade of raw milk. Children were most affected. The malady was variously diagnosed as epidemic adenitis, sore throat, pharyngitis or tonsillitis. The initial symptom was sore throat of moderate severity. A few patients experienced nauseating nasopharyngitis, a few otitis media, but the most constant development was inflammation of the submaxillary and cervical lymph-nodes. Recovery was sometimes quite slow, and was characterized by recurrent periods of high temperature.

In the study of the epidemic, the smears examined were made from cultures from the throat and tonsils of the patients, from the throats of the dairy employees, and from the milk of each cow of the herd.

The organism responsible for this epidemic was one which produced a beta type of hemolysis. It grew readily, and formed surface colonies, which were large, watery and showed capsules in the smear. This organism has been termed by the authors the *Streptococcus epidemicus Davis*.

The infection was traced to the milk from a single quarter of the udder of a cow in a dairy of 112 cows producing an otherwise excellent grade of raw milk. A number of the milkers on the farm were found to be infected. It was impossible to trace the infection of the cow's udder to any one of the milkers, although such an infection seems probable in view of the fact that the streptococcus isolated from the cow was in every respect like the streptococci isolated from the patients and milkers, and different from those usually found in normal cows or in cows with garget.

H. M. FEINBLATT.



BARKER, L. F.: Remarks on the Functions of the Suprarenal Glands as Revealed by Clinical Pathological Studies of Human Beings and by Experiments on Animals. *Endocrinology*, July-Sept., 1919, iii, No. 3, p. 253.

The value of correlation between endocrine investigations, including those of the preclinical and medical sciences, as well as those of diagnosis and therapy, and the allied sciences of pathological anatomy and pathological physiology, is considerable, and lies in the difference in view-point of the various investigators. The clinical observations of Addison, and of later observers, have defined a syndrome associated with destruction of the adrenal gland and an insufficient supply of its secretion in the body. A second syndrome is noted which has to do with overactivity of the gland and is evidenced by a marked change in sexual characteristics, such as pubertas præcox, hirsutism, virilism.

The laboratory contributions have been:

(1) The two types of substances in the gland, the cortex and medulla were differentiated.

(2) It was found that in the human and higher animals the medulla is derived from the anlage of the sympathetic nervous system, whereas the cortex is derived from the germ epithelium, since in the lower animals these exist as parts of two anatomically separate series of organs, one a part of the so-called interrenal system, the other a part of the chromaffin system.

(3) It was proved that the function of the interrenal system was necessary for life, and that death of the higher animals is due to the absence of this interrenal part or cortex.

(4) Schaeffer demonstrated that extracts of the suprarenal gland, when injected, caused a rise in blood-pressure.

(5) The demonstration showed that this blood-pressure-raising substance was derived from the chromaffin part, the medulla, and is a well-defined substance known as adrenalin.

(6) A pressor substance was isolated which is not epinephrin, and is derived from the cortex.

The various hypotheses which sprang up from these discoveries have led to a vast amount of investigation.

L. C. JOHNSON.

KOOPMAN, J.: The Influence of the Thyroid Gland on the Formation of Antibodies. *Endocrinology*, July-Sept., 1919, iii, No. 3, p. 318.

Rabbits which, after repeated injection with sheep corpuscles, formed hemolytic amboceptor in the serum with a titer of 1:100, developed a titer of 1:1,200 after two months' treatment with thyroid substance, and young rabbits born of this male and a female with a titer of 1:6000 showed, after 3 injections of sheep's corpuscles, titers of 1:3000; 1:8000; 1:3600; and 1:150. This last rabbit, after nine weeks of thyroid treatment, developed a titer of 1:2000. Since the formation of hemolytic amboceptor is especially an antibody formation, the question is raised as to whether thyroid has an influence on the formation of antibodies, agglutinins, antitoxins, etc

L. C. JOHNSON.

HAMMETT, F. S.: The Functions of the Internal Secretion of the Placenta. *Endocrinology*, July-Sept., 1919, iii, No. 3, p. 307.

Since Johannes Müller, in 1884, designated the placenta as a secretory organ, its production of eclampsia has been much discussed. It appears that eclampsia is not due to secretion by the placenta but rather to a decrease or perversion of the intermediary metabolic function of the placenta, keeping up an increased permeability and impaired detoxicating ability of the villi; this results in an extra burden upon the liver and kidneys of the mother. It has been found from experimental evidence that the placenta has little if any influence upon the mammary hyperplasia of pregnancy, and that its only influence on milk secretion is to cause a slight rise in the level of protein and lactose, with a lowering of the fat.

After feeding 10 grains (0.65 gram) of desiccated placenta to the mothers three times a day, and studying the weight curves of their infants, from the first to the fourteenth day, as compared with those of other individuals, it was concluded that there was a substance in the placenta which was passed on to the infant in the milk, and which acted as a stimulus to growth. This justifies the consideration of the placenta as a ductless gland.

L. C. JOHNSON.

LEWIS, H. B.: The Antiscorbutic Value of the Banana. *Journal of Biological Chemistry*, 1919, xl, 91.

The antiscorbutic property of the banana was tested in experimental scurvy of guinea pigs. The author concludes that when bananas supplement a diet otherwise adequate they have considerable value as an antiscorbutic, though their potency in this respect is not as great as that of the orange or the potato.

W. H. EDDY.

SUGIURA, K., AND BENEDICT, S. R.: The Nutritive Value of the Banana, II. *Journal of Biological Chemistry*, 1919, xl, 449.

This paper presents, in addition to detailed studies of the adequacy of the banana in terms of protein and the ordinary vitamins, some new findings in regard to protein-free milk and its components. The conclusions are as follows:

(1) A diet consisting of bananas (83.0 per cent), casein (16.0 per cent), yeast (0.5 per cent), and protein-free milk (0.5 per cent) is an adequate diet for the growth, maintenance, reproduction and perfect milk production of albino rats.

(2) Protein-free milk contains a substance which is needed for suitable milk production by the mother. This substance does not appear to be associated with purified milk sugar or inorganic constituents of the milk and indicates the presence of a new accessory substance that is lacking in yeast.

(3) Bananas and milk in proper proportions apparently constitute a complete food.

W. H. EDDY.

SHERWIN, C. P., AND KENNARD, K. S.: Toxicity of Phenylacetic Acid. *The Journal of Biological Chemistry*, 1919, xl, 259.

Attention is called to certain peculiarities of phenylacetic acid as a decomposition product of intestinal protein putrefaction; namely, its production from phenylalanin and tyrosin, its resistance to oxidation and alteration by combination with other compounds, its combination in the human body with glutamin and its excretion as pheny-



lacetyl glutamin, whereas animals detoxify it by combining it with glycocoll and excreting it as phenaceturic acid. It has been held by certain workers (Salkowski) to be non-toxic, and the present paper aims to determine this point. Experiments were conducted with animals (hens and dogs) and human subjects. Definite evidence was obtained of its toxic character, and in many respects these symptoms resembled those of alcohol poisoning. The degree of toxicity was determined by experiments with a small dog of 7.5 kilos body weight, giving 1 gram the first day and increasing the dose by 1 gram each succeeding day. The progressive effects were noted and death resulted on the seventh day. Autopsy and microscopic findings indicated that as a result of excessive doses the secreting epithelium of the proximal convoluted tube of the kidney is markedly affected, that the endothelium of the blood-vessels is not affected, that the endothelium of the arched collecting tubule shows evidence of a destructive action, while that of the straight collecting tubule appears to escape. The secreting epithelium of Henle's loop is most distinctly involved.

W. H. EDDY.

JACKSON, D. E., AND MILLS, C. A.: An Experimental Investigation of the Pharmacologic Properties of the Active Principle of Commercial Pituitary Extracts, and of the Comparative Action of Histamin. *The Journal of Laboratory and Clinical Medicine*, Oct., 1919, v, No. 1, p. 1.

The article deals with the comparative action of pituitary extract and histamin on the uterus, blood-pressure, and lungs. Graphic charts are given, illustrating the action of these drugs and showing that histamin causes contraction of the uterus, fall in blood-pressure, and marked contraction of the bronchioles.

The commercial "pituitrin," of Parke, Davis and Co., caused a contraction of the uterus, a very considerable and prolonged rise in blood-pressure, but had scarcely any effect on the bronchioles. "Infundin," of Burroughs, Welcome and Co., caused a marked rise in the blood-pressure and a slight bronchoconstrictor action. Armour's "pituitary liquid" caused a marked increase in blood-pressure and slight bronchoconstriction. Mulford's pituitary extract and Heister's pituitary preparation caused a slight rise in blood-pressure, and moderate bronchoconstriction.



It was found that histamin and tyramin mixtures did not possess the same action as pituitary extract. The action of histamin (marked bronchoconstriction) seemed to be too prominent, or, if the drug is administered in small enough proportions not to affect the bronchioles, it would be too little to act sufficiently on the uterus.

The conclusions showed that histamin is a profound constrictor of the bronchial musculature, but that the true active principle of the posterior portion of the pituitary gland is almost, if indeed not entirely, without any action on the bronchial muscle, and exerts its action in the body by stimulation of certain nervous elements, possibly some portion of the sympathetic mechanism.

The true active principle of the posterior portion of the pituitary gland produces constriction of the uterus but fails to contract the bronchioles. Certain commercial preparations apparently contain very small and variable proportions of histamin, which is enough in some samples to exert more or less therapeutic action but is not a necessary constituent of first class preparations of pituitary gland.

Pituitary extract is shown to have very obvious clinical advantages over the bronchoconstricting and blood-pressure-lowering histamin, for obstetrical uses.

C. M. ANDERSON.

VAN SLYKE, L. L., AND BAKER, J. C.: Carbonic Acid and Carbonates in Cow's Milk. *Journal of Biological Chemistry*. 1919, xl, 335.

The authors drew milk from the cow's udder into a 100 cylinder so as to fill the cylinder from the bottom upward, in order to avoid mixture with air or loss of  $\text{CO}_2$ ; they forced 2 c.c. of milk from the cylinder into the Van Slyke  $\text{CO}_2$  apparatus without loss of  $\text{CO}_2$  and used a 20 per cent solution of lactic acid to free the  $\text{CO}_2$  in carbonates. They report the following results:

(a) Milk drawn from separate quarters of the udder shows a  $\text{CO}_2$  variation of from 7 per cent to 86 per cent by volume. The pH value varies from 6.50 to 7.16 in a general way, increasing with the  $\text{CO}_2$  content; the degree of acidity as measured by titration tends to decrease with an increase of  $\text{CO}_2$  content. These results are higher than those reported by previous workers. The  $\text{CO}_2$  content of normal milk appears to be approximately 10 per cent by volume.

(b) It is possible to remove  $\text{CO}_2$  from milk completely by vacuum exhaustion, if the milk is spread in a thin layer and kept moving.

(c) Pasteurizing decreases the  $\text{CO}_2$  content but does not change the pH value. If  $\text{CO}_2$  is completely removed before pasteurizing, the pH value is decreased slightly by the pasteurization.

(d)  $\text{CO}_2$  exists in milk as  $\text{H}_2\text{CO}_3$  and as  $\text{NaHCO}_3$  in ratio of about 1:2, and the  $\text{CO}_2$  tension in milk is calculated to be equal to 50-55 mm. of mercury at  $20^\circ \text{C.}$ , in the case of a 0.01 N solution with a pH value of 6.60.

W. H. EDDY.

VAN SLYKE, L. L., AND BAKER, J. C.: Conditions Causing Variation in the Reaction of Freshly Drawn Milk. *Journal of Biological Chemistry*, 1919, xl, 345.

This paper is a discussion of the reaction of milks as an indicator of composition and abnormal conditions. The findings are:

(a) In over 300 samples of fresh milk examined the pH value varied from 6.50 to 7.20, being under 6.76 in 80 per cent of the samples. High acidity, therefore, is more frequent than low, and decreased acidity is an indicator of abnormal conditions.

(b) In the case of milk from 20 cows the pH value of milk from different quarters of the udder varied greatly, but in most cases the variations were not large.

(c) The decrease in pH value is usually accompanied by marked changes in composition, decrease in specific gravity, and in the percentage of fat, total solids, non-fatty solids, casein and lactose, but by an increase in proteins other than casein and in ash and chlorin. These changes are such as would be expected in case blood-serum or lymph were added to normal fresh milk. Examination of milks whose pH is above 6.80 indicates that the reaction is accompanied by the presence of large numbers of leukocytes, though the reaction in such cases may be neutralized by the presence of large numbers of acid-producing streptococci. The authors attempted to prove the presence of blood-serum or lymph in such milks by tests for glucose, but were unable to demonstrate its presence.

W. H. EDDY.

BAKER, J. C., AND VAN SLYKE, L. L.: A Method For the Preliminary Detection of Abnormal Milk, Based on the Hydrogen-ion Concentration. *Journal of Biological Chemistry*, 1919, xl, 357.

Attention is called to the inadequacy of the ordinary measures used to detect abnormalities in market milks, the inaccuracy of specific gravity determinations for this purpose, and the need of a more comprehensive and reliable method. Preliminary work has shown that the hydrogen-ion concentration of milk is extremely sensitive to the production of acid by bacteria, by the addition of formaldehyd solution, the addition of acids, heating above a given temperature, the addition of water, the addition of alkali or alkaline salts, and the removal of fats. The first step in the use of hydrogen-ion concentration for such tests consists in the development of a suitable indicator, which the authors find in dibromorthocresol-sulphonephthalein or "brom-cresol-purple." The main features of the method are as follows: To one drop of a saturated water solution of the dye are added 3 c.c. of milk, and the color observed. In average normal milks this color is a fairly uniform bluish gray. If the color is different from this there is ground for suspicion. The color is made lighter by acids, acid salts, formaldehyd solution, and also by heating above the usual point of pasteurization. The color becomes deeper blue in the case of milk from diseased udders, watered milk, skimmed milk, and milk containing added alkali or alkaline salt. Details are given as to the operation of the method and suggestions as to its standardization.

W. H. EDDY.

STEVENS, F. A., AND KOSER, S. A.: Streptolysin Production in Carbohydrate Media. *The Journal of Experimental Medicine*, Dec. 1, 1919, xxx, No. 6, p. 539.

The inhibition of the hemolytic power of streptococci, in media to which fermentable sugars have been added, has been commented on by various writers. Kuhn explained the effect of glucose by the



theory that in carbohydrate media which were fermented by streptococci, the metabolism of the organism changed so that red-cells were spared the direct lytic action of the bacteria. Kendall and Farmer, studying the nitrogen metabolism, found that the principle of protein-sparing action of carbohydrate was as true in bacterial as in animal physiology.

The media employed for the production of hemolysin was a beef infusion (2 per cent peptone) broth with the addition of 20 per cent inactivated horse serum. Hemolysis was determined by setting up a series of tubes containing increased amounts of sterile filtrate, or by taking the supernatant fluid after centrifuging a portion of the culture at high speed for ten minutes: 1 c.c. of 5 per cent human cell suspension was added to each tube, incubated one-half hour and diluted to 5 c.c.; the undissolved cells were then counted.

The effect of sugars was observed on plates made with 5 per cent defibrinated human blood and 1 per cent carbohydrate. The streptococci used were obtained from acute empyema fluids; five strains were chosen which had a beta type of hemolysis and a hydrogen-ion concentration of pH 5.2 to 4.9 in dextrose broth. In liquid media they fermented dextrose, maltose, saccharose, lactose and salicin, but not mannite, inulin, glycerol or raffinose. The first three constantly inhibited hemolysis. Lactose and salicin were more constant.

It was found that when the hydrogen-ion concentration of the media was increased before inoculation the growth of streptococci and the hemolysin produced were proportional to the pH.

It is evident that there are numerous interaction factors which affect streptolysin in the presence of fermented sugars. The principal action is the change in the metabolism of the streptococcus by which more carbohydrate and less protein is utilized; although the growth is much increased there is proportionately less hemolysin. The acid developed in these cultures not only lessens the vitality of the growing organism and so lessens proteolysis, but is destructive to hemolysin at incubator temperature. The concentration of the acid produced causes some hemolysis, and a coincident brown discoloration of the hemoglobin. These principles may be applied to both liquid and solid media.

H. M. FEINBLATT.



STEENBOCK, H., AND GROSS, E. G.: Fat-soluble Vitamin. II. The Fat-soluble Vitamin Content of Roots, Together With Some Observations on Their Water-soluble Vitamin Content. *Journal of Biological Chemistry*, 1919, xl, 501.

A careful study has been made, by feeding experiments with rats, of the amount of the "A" and "B" vitamin in certain vegetables. The method consists in brief of adding to a basal diet adequate in all other dietary factors specific percentages of the substance to be tested. The detailed results supply statistical data of great value in the use of these materials as sources of "A" and "B" vitamin.

*Carrots.*—Five per cent dried carrots does not furnish enough "A" nor "B" for growth, and when supplemented by butter fat is still deficient in "B." Ten per cent furnishes enough "B" and no growth increase results from more. Fifteen per cent is approximately sufficient in both "A" and "B," and when supplemented by additional "B" no improvement results. Young were successfully reared on this diet. When supplemented by "A" slight improvement (palatability?) results. Twenty-five per cent produces digestive disturbance in some animals.

*Wheat Embryo.*—The water-soluble vitamin preparations do not carry any appreciable amount of "A."

*Swedes or Rutabagas.*—Fifteen per cent carries plenty of "B" for growth and rearing of young, but not enough "A" for growth. Twenty-five per cent is insufficient in "A." Sixty per cent may carry enough "A" but creates digestive disturbances.

*Dasheens.*—Fifteen per cent raw furnishes enough "B" for long-continued growth, but no demonstrable amounts of "A." Cooked, 83.5 per cent gives no evidence of an "A" content.

*Red Beets.*—Fifteen per cent contains no demonstrable amounts of "A," but in a complete ration does not interfere with growth. It is practically free from "A."

*Parsnips.*—Fifteen per cent is not sufficient in "A," but, like red beets, does not interfere with growth in a fat diet.

*Potatoes.*—Fifteen per cent raw supplies enough "B" for long-continued growth, but not enough "A." Twenty-five per cent is still insufficient in "A." Sixty per cent cooked may permit long-continued subnormal growth, indicating the presence of "A," but many potatoes lack sufficient "A" for this.

*Mangels.*—Twenty-five per cent does not contain enough “B” for growth, but in a complete diet exerts no prejudicial action. Mangels are also deficient in “A.”

*Sugar Beets.*—Like mangels, these are very poor in “B” and also are also deficient in “A.”

*Yellow Sweet Potatoes.*—They are very rich in “A” but low in “B.” Fifteen per cent, oven dried, does not furnish enough “B” for growth, but 25 per cent does. Sixty per cent allows normal growth and rearing of young. Fifteen per cent, air dried, furnishes little if any more vitamin than oven dried. In both the deficiency in “B” is prominent.

Some vegetables, therefore, are to be classed with leafy materials as sources of “A,” while others are like cereals in their lack of the same. The results also show that it is generally not justifiable to associate great physiological activity with an abundance of vitamin.

Commenting on earlier studies of butter fat “A,” the authors call attention to the fact that while this substance is relatively unstable to heat (contrary to Mendel) the vegetable “A” in these experiments is quite stable.

W. H. EDDY.

REIMANN, S. P., AND HARTMAN, F. L.: Effect of Anesthesia and Operation on Certain Metabolites. *American Journal of Physiology*, 1919, 1, 82.

In a previous study the authors demonstrated certain changes in the acid-base equilibrium during anesthesia. They wished to determine whether  $\text{CO}_2$  should be given with the anesthetic or alkali before or after the anesthetic. The particular studies reported in this paper were to determine, if possible, changes in nitrogen metabolism during anesthesia. Determinations were made of non-protein nitrogen, total nitrogen, urea ammonia, etc., in the blood and urine of the patients before and after anesthesia. Their view was that if acids are increased during anesthesia the titratable acidity of the urine should increase, and the blood urea should decrease as a result of increased demand for ammonia. The urinary urea should possibly decrease and the urine ammonia increase. Results of analyses on 90 patients are given. The urinary acidity met the authors' expectations, in-

creasing in every case. The blood urea and the non-protein nitrogen increased instead of decreasing. In the urine the general tendency of the ammonia was to increase, but the amount of urea was either increased or decreased with apparently no relation between the urea in the urine and in the blood. The results with the blood urea and non-protein nitrogen suggested retention or increased production. They do not believe retention explains the matter and argue an increased metabolism in the usual way down to urea. The failure of the ammonia to increase in quantity they do not hold to be especially significant, in view of the other forms of alkali available. They admit that they have not eliminated abnormal metabolism. They conclude that small but definite changes in metabolism take place during anesthesia. The reduction of the bicarbonate of the blood-plasma which occurs must be due to these changes and not to mere over-ventilation as suggested by Henderson. Hence  $\text{CO}_2$  should not be given with the anesthetic. Alkali should be given in selected cases.

W. H. EDDY.

RAIZISS, G. W., KOLMER, J. A., AND GAVRON, J. L.: Chemotherapeutic Studies on Organic Compounds Containing Mercury and Arsenic. *Journal of Biological Chemistry*, 1919, xl, 533.

The authors report the synthesis of various compounds which combine arsenic and mercury in the molecule. Such compounds are comparatively stable in alkaline solution. The splitting off of metallic mercury occurs only in compounds containing an amino group. The process of formation of the organic arsenical mercury compounds and their chemical properties does not differ substantially from that of organic mercury compounds containing no arsenic acid group. The toxic effect on the animal is mainly caused by the mercury group, the arsenic acid group neither increasing nor decreasing the toxicity of the compounds.

The curative influence of these new compounds in experimental trypanosomiasis and their germicidal effect *in vitro* were not superior to the ordinary organic compounds.

W. H. EDDY.



## SECTION ON PEDIATRICS

LINDSAY, LIONEL M.: Spasmophilia (Infantile Tetany). *The Canadian Medical Association Journal*, Jan., 1920, x, 43.

Lindsay lays no claim to any original work on spasmophilia; he chose this topic for his paper because many practitioners do not seem to recognize the condition, and therefore treat it improperly and often with disastrous results. He defines spasmophilia as a hyperirritability of the peripheral nerves to mechanical and electrical stimulation, with a tendency to tonic and clonic spasms. Most of the convulsions in infants from six to eighteen months of age are probably caused by tetany.

The most characteristic symptoms are: (1) *laryngospasm*, or *laryngismus stridulus*; (2) *tetany* or *carpopedal spasm*; and (3) *eclampsia*, or *general convulsions*.

Laryngospasm is the earliest and most common manifestation; it may vary from a slight inspiratory crowing to attacks of apnea, often described as "internal convulsions." Emotion or shock may bring on an attack, which may lead to a series of general convulsions or may terminate in sudden death due to cardiac failure.

Tetany is much less frequent. The arms and legs are held in tonic flexion; the hands assume the so-called obstetrical position, and the feet are held in a position of equinovarus. These attacks may be paroxysmal and last for hours. When the attacks are of long duration the hands and feet may become swollen. The little patients retain consciousness, so that they often suffer from considerable pain until the spasm is relaxed.

Other muscles may share in the involvement: the face may be affected, giving it a mask-like appearance; there may be strabismus,

opisthotonos and, according to Abt, asthmatic attacks, due to spasm of the bronchial muscles. The general convulsions are not unlike those of epilepsy. There is a primary tonic and a secondary clonic stage; then the convulsion subsides and in two or three minutes relaxation occurs. The child becomes conscious and appears normal again. The attacks may succeed each other so rapidly that the condition simulates status epilepticus. The number and severity of these attacks varies considerably in different children. These eclamptic attacks are not as dangerous to life as the severer forms of laryngismus stridulus. They are never accompanied by fever except when there is a complicating infection, which may have precipitated the attack.

The differential diagnosis becomes comparatively easy when it is borne in mind that the children are apparently normal between the seizures but show increased mechanical and electrical irritability. There is no fever and no evidence of meningeal involvement.

Over 90 per cent of all cases of general convulsions of infancy are due to spasmophilia and not to dentition, worms, epilepsy, etc. Many infants with a hyperexcitable nervous system do not show the above manifestations, but are potential victims of convulsions and cramps, which may be brought on by fright, fever, improper diet, etc. In other words, they are latent spasmophilics. The recognition of this latent group is of importance because by proper treatment the spasms and convulsions may be prevented.

Every case of latent spasmophilia may show one or all of the following signs, any of which is sufficient to determine the diagnosis: (1) *increased irritability to galvanism*, (2) *Chvostek's sign*, and (3) *Trousseau's sign*.

(1) Increased reaction to electrical stimulation of the median or peroneal nerve is the earliest and most important phenomenon. The presence of a cathodal opening contraction with less than 5 milliamperes of galvanic current is sufficient to establish the diagnosis, while the absence of such a contraction excludes it.

(2) The Chvostek sign is elicited by tapping the cheek over the facial nerve, in spasmophilia, producing an involuntary contraction of the ocular or oral muscles. Tapping the peroneal or ulnar nerves will result in similar contractions of the muscles supplied by these nerves. This sign is not as constant as the increased electrical excitability, and is of greater value in infants than in

older children. Its presence is sufficient to establish the diagnosis but its absence does not exclude it.

(3) Trousseau's sign is the production of carpal or pedal spasm after compression of the arm or thigh has been maintained for a minute or two. This procedure is painful and may precipitate a general convulsion. It is not known whether Trousseau's phenomenon is due to interference with the conductivity of the nerve or with the arterial circulation. The sign is the least reliable of the three.

The disease tends to run a long, irregular course with intermissions and recurrences; it tends to improve in the summer and may even completely subside. Many of the sudden deaths in children ascribed to "status lymphaticus" are in reality due to tetany of the cardiac muscle in spasmophilia. Ultimately the patients become neuropathic, or intellectually defective; in only about one-third of them is development normal.

The etiology and pathogenesis are not quite clear. Rickets is usually if not invariably present, but seems to be a distinct condition. Most of the patients are pale flabby children with a previous history of excessive carbohydrate feeding, especially of proprietary infant foods. They are usually constipated. There is a tendency nowadays to consider spasmophilia, like rickets, to be a disease due to insufficiency of vitamins of the fat-soluble A class. The deficiency in vitamin is in some way associated with a disturbance of salt metabolism; the normal balance between sodium and potassium on the one hand, and calcium and magnesium on the other, is upset. Sodium and potassium act as irritants to the nervous system, while calcium and magnesium are sedatives. It has long been known that feeding with calcium in sufficient quantities alleviates tetanoid symptoms. Howland and Marriott of Baltimore found that spasmophilia was always associated with a reduction of calcium, and tetanoid symptoms may be expected to appear whenever the calcium of the blood falls below 7 milligrams per 100 c.c. The cause of the calcium deficiency is not known. It is probably due to defective absorption and assimilation rather than to paucity of calcium in the food. Whenever the calcium content of the blood is raised to normal the symptoms of tetany disappear immediately. This naturally occurs much sooner if the calcium is administered intravenously than if it is given by mouth. Magnesium does not seem to be a determining factor in the production of tetanoid symptoms. Although extirpation of the para-



thyroid gland in dogs produces tetany, all investigators do not agree with the general opinion that these glands play any rôle in the etiology of tetany in childhood. Howland and Marriott, however, do believe that the symptoms of human tetany are probably due to some dysfunction of these glands. Some authors have emphasized heredity as a predisposing etiological factor in spasmophilia.

In the prevention of tetany, breast-feeding is of paramount importance, provided the mother's diet and general hygienic condition are carefully looked after. When breast-milk can not be obtained, cod liver oil and phosphorus should be administered in small quantities during the winter months. Cod liver oil alone will not suffice.

Lindsay divides the treatment into two stages: (1) the *control of the spasms and convulsions*, and (2) the *correction of the underlying condition*. The former is best accomplished by the administration of calcium in sufficient doses by mouth. Calcium chlorid is considered to be the best preparation, but the lactate may also be employed. The usual quantity is about 1 dram (3.90 grams) a day, in divided doses, mixed with the food. For the convulsions chloral and bromids are necessary at the beginning to check the symptoms until the calcium can be absorbed. For this purpose calcium bromid is a very useful preparation, while a more rapid effect can be obtained by the hypodermic injection of an 8 per cent solution of magnesium sulphate (2 to 4 drams or 7.50 to 15 c.c.). An initial cathartic, to drain off the large amounts of the irritating soda and potash salts, is advisable. For the first day or two the diet is to consist exclusively of cereals.

To overcome the underlying pathological condition, it is necessary to determine what that may be. If due to a deficiency of vitamins these elements must be supplied. Although the milk of a healthy woman is the ideal food, and may be said to be a specific, when that cannot be obtained, suitably modified cow's milk may be given. According to Lindsay's experience it does not seem to be a good practice to deprive a young child of milk for any length of time. One naturally avoids whey on account of the tendency of sodium and potassium to produce spasmophilia. A sufficient amount of fat-soluble A vitamins in the form of fresh milk and cream, egg yolk and cod liver oil is indicated. The addition of phosphorus (olei phosphorati B. P.  $1\frac{1}{2}$  to 1 drop, freshly prepared) to cod

liver oil is the classical treatment. The use of malt extract also favors the retention of calcium. In addition to these plans of treatment the beneficial effects of sunshine, fresh air and general hygienic measures in any nutritional disease must not be forgotten.

M. KESCHNER.

ROWAN, J. J.: Serum Treatment of Epidemic Poliomyelitis Occurring in Dubuque, Iowa, During the Summer of 1918. *Medical Record*, December 13, 1919, xcvl, 972.

Although most investigators, notably Dr. Flexner and his co-workers, contend that the etiologic factor in poliomyelitis is a filterable virus, and that it is impossible to obtain a suitable neutralizing serum, Rowan was not inclined to ignore the contentions of Dr. Rosenow that the streptococcus isolated by him might be the aërobic and antigenic form of Noguchi's and Flexner's globoid bodies, particularly in the light of the results obtained by him in the Davenport epidemic of 1917. He therefore utilized the serum from horses bled after repeated injections of the pleomorphic streptococcus, which Rosenow isolates constantly from the central nervous system in poliomyelitis.

The cases presented practically a uniform clinical picture. In a few instances the first symptom was a sudden inability to use a muscle or group of muscles, followed by the usual manifestations of fever; but in the majority of cases the parents first noticed that the child was less active than usual. It was more inclined to lie down than to play, and was restless and wakeful. The symptoms were often so mild that they were attributed, in the beginning, at least, to playing too energetically, to the sun, to constipation or what not. Close questioning elicited the fact that the little patient had had a moderately sore throat, but examination usually failed to show marked evidence of inflammation. Palpation of the tonsils almost invariably revealed tenderness, as a result of an inflammatory process deep down in the trabeculae and interstices of the tonsillar tissue, and one or more enlarged lymph-glands immediately outside of the tonsils. Pressure on the tonsils often ruptured pus pockets deep in their substance. An interesting observation in connection with the author's own cases was that all of the patients had adenoids or diseased tonsils; it would

appear from this that lymphoid tissues offered a vulnerable point of attack for the poliomyelitic virus.

The prodromal symptoms lasted a day or two, and then subsided, creating among the parents a false sense of security, to be followed in another day or two by a recurrence and marked evidence of involvement of the central nervous system, in the form of muscular paralysis. In the early stages, a very careful examination elicited, in nearly all cases, a weakness in certain muscles or groups of muscles. In such cases this is the time to make a tentative diagnosis. Lumbar puncture showed the cerebrospinal fluid to be under pressure, with a positive cell-count and Noguchi globulin test. This is the ideal time to inject the serum.

A vein is selected, at the bend of the elbow, or at the ankle, or, in very young infants, the jugular vein is used. The area to be injected is sterilized with iodine and alcohol; compression is applied, to fill the vessel, which is to be released on the entrance of the needle. An ordinary 50 c.c. Luer syringe is used, and the injection is made very slowly, fifteen to twenty minutes being required for administering as many cubic centimeters. The serum must be warmed, and the dose is approximately as follows: children under 2 years of age, 5-15 c.c.; 2 to 5 years, 10-25 c.c.; 5 to 12 years, 15-40 c.c.; over 12 years, 20-75 c.c. If no beneficial effect was noted within eight hours, Rowan always repeated the treatment, except that he gave double the initial dose. In only 2 or 3 cases was a second injection necessary.

From June 18 to September 3, 1918, 81 cases of poliomyelitis were reported to the City Recorder's office. From June 18 until July 5, the date on which Dr. Rosenow arrived in Dubuque, 13 cases were reported. Four cases, which were incorrectly diagnosed, occurred in addition. One of these died, thus making a total of 17 cases, of which 8 died, constituting a mortality rate of 47 per cent. These were all untreated cases. Sixty-eight cases occurred after Dr. Rosenow's arrival. Three patients died during the night immediately prior to the use of the serum. In the case of 4 of the patients treated with serum on the first two days the prognosis was most unfavorable. The diagnosis in each of these 68 cases was corroborated by the examination of the spinal fluid, so that there can be no doubt as to the correctness of the diagnosis. All of the cases which were seen before paralysis had set in and in which the serum was administered promptly, recovered without developing paralysis. In nearly all of



the cases where slight paralysis had occurred, the paralysis was arrested, and all the patients recovered without residual paralysis. In the 2 fatal cases, the diagnosis was made late. One was a poorly nourished, feeble, two weeks old baby, without definite paralysis, who died apparently of malnutrition. The other death occurred in a girl 18 years of age, who had been severely ill for four days; a rapidly progressing paralysis of the ascending type began thirty-six hours previously. At the first injection there was practically a complete paraplegia, paralysis of the muscles of the back, of the bladder and rectum, of the left arm, a marked weakness of the muscles of the right arm, of the neck and muscles of deglutition, with marked dyspnea and cyanosis due to paralysis of the muscles of respiration. The temperature was lowered and the paralysis was arrested for forty-eight hours. Eighteen hours after the third injection of serum respiratory embarrassment recurred, and the patient died twelve hours later.

In the remaining patients with advanced paralysis, the progress of the disease was arrested in every case; a distinct improvement in muscle function occurred soon after injection in those in whom the paralysis had become stationary. Post-paralytic pains, if still present, were relieved as long as ten days after onset, in the case of those in whom the spinal fluid still gave evidences of an active process. In only 3 of the cases treated with serum was there a residual paralysis, and in all of these the serum was given late, in 1 case on the third day, and in the other 2 on the eighth day after the paralysis had set in. The author has seen improvement in fifteen minutes' time, and in 90 per cent of the early cases convalescence was well established within twenty-four hours.

Following the administration of the serum in this epidemic, the author observed no severe case of serum sickness. In 3 of his cases an urticaria developed, which disappeared very rapidly. In a number of instances he had previously injected diphtheria antitoxin, and in these cases he injected  $\frac{1}{2}$  c.c. of serum and, after an hour, gave the entire amount.

The lessons taught by this epidemic are summarized by Rowan as follows: In the presence of an epidemic of infantile paralysis anywhere in the country all cases of obscure disease or indisposition in children, especially those under ten years of age, should be subjected to the closest scrutiny until a definite diagnosis is made. Par-

ticular attention should be given to the usual gastric disturbances. Greater effort should be made to impress upon parents the importance of having adenoids promptly removed by a competent specialist. If a second case should develop all places where children are apt to congregate should be quarantined. In every suspicious case of muscle weakness lumbar puncture should be made and the fluid carefully examined; if conditions are such that the specimen must be sent to a distance for analysis, no time should be lost in waiting for the report, but the serum should be administered at once. If the disease is not present, no harm will be done, and the delay may save a healthy child from becoming a hopeless cripple.

M. KESCHNER.

PISER, G. R.: Common Disorders of Childhood. *The Medical Clinics of North America*, Sept., 1919, iii, No. 2, p. 341.

Constipation, enuresis and rhinitis comprise the subjects of a brief article in which certain facts are featured by case reports.

Constipation may be due to various congenital anatomical defects, such as narrowing of the intestines, elongation of the sigmoid flexure, and Hirschsprung's disease. These often go unrecognized until revealed by an x-ray study of the intestinal tract. Dietetic error on the part of the mother is often the causative factor in the case of a nursing infant, and examination of her milk often shows a low total solid and fat content (below 2 per cent). In the case of a bottle-fed infant, correcting an improper formula will often suffice to effect a cure. Deficiency of intestinal secretions, spasms of the sphincter, and fissure of the anus, are also mentioned as causes. The author condemns the drastic action of castor oil and prefers the milder laxatives. The daily use of suppositories and enemas is not advisable. Cases showing deficient intestinal secretions are often benefited by the administration of nitrate of potash or sulphate of soda.

The importance of rhinitis is due to the conditions which a further extension of the process may give rise to, such as otitis media, bronchopneumonia, etc. A rhinitis due to diphtheria, lues, or a beginning measles may be an early symptom of these conditions, and must be considered in the diagnosis. In the treatment of a simple rhinitis internal medication is rarely necessary. Nasal irrigations and douching should never be employed.

The majority of the cases of enuresis are not due to phimosis, hyperacid urine, or adenoids, but to lack of control of the sphincter centers, or higher cerebral centers. It is important to know whether the child has at any time overcome the infantile condition of incontinence. The treatment is based on the removal of any possible physical cause, the establishment of proper diet and hygiene, and the avoidance of fatigue and nerve stimulation. Voluntary control over the lower centers by bladder control exercises (which are described) will, in the majority of cases, be followed by excellent results.

H. WOLFER.

SEHAM, M.: The Acidotic State of Normal New-borns. With Special Reference to the Alveolar  $\text{CO}_2$  Tension, Alkali Tolerance and Acetonuria. *American Journal of Diseases of Children*, July, 1919, xviii, No. 1, pp. 42-50.

The author has investigated experimentally Ylipso's conclusions that (1) the human organism is in a state of "physiologic acidosis" at birth, that (2) the blood shows an "acidotic constitution," that (3) the  $\text{CO}_2$  dissociation curve of the blood of new-borns shows an acidosis.

The method used was that of determining the  $\text{CO}_2$  alveolar tension. As the exchange of  $\text{CO}_2$  between the lungs and the blood takes place in the alveolæ, the tension of the different gases in the alveolæ will be practically the same as in the blood. One hundred and fifty-one tests were made on 50 babies ranging from one hour to a week old, using the Higgin's-Plesch method, which consists in applying a pulmotor mask snugly over the face, preventing any escape of gas. According to this method, the baby rebreathes the air in the bag until it is in equilibrium with the air in the alveolæ; the initial amount of air in the bag, the length of time for respiration and the character of the breathing, are observed and readings are made directly after respiration is completed. After experimenting with larger amounts of air the author found 50 c.c. to be the most suitable amount, and 30 seconds the best breathing period.

According to the results, given in tables, there was no definite evidence of a lower  $\text{CO}_2$  tension indicative of an acidotic state.

Food, or the lack of it, movement, crying, etc., seemed to have no effect upon the alveolar tension.



The author also tested the alkali tolerance of normal, new-born babies, as determined by the amount of sodium bicarbonate necessary to change the urine reaction from acid to alkali. Sodium bicarbonate, 5.2 grains (0.33 gram) administered orally every two hours, proved to be too large a dose, and always caused vomiting, but 2.5 grains (0.16 gram), given every two hours, was retained. It was found that the lowest amount necessary to change the urine to alkaline was  $1/6$  grain (0.01 gram), the highest, 61.73 grains (4 grams), the average 26 grains (1.7 grams). The author does not consider that these results necessarily indicate a high acidity in the urine of the new-born, even though a partial acidity is present.

Determinations of the acetone in the urine of 10 normal new-borns showed very small quantities only, and failed to support the statement that an acidotic condition exists at birth.

As these results are on the whole inconclusive, the author hopes that further experiments can be made with the view of investigating the alkali reserve and the pH of the blood of normal new-borns.

## SECTION ON

# ROENTGENOLOGY, LIGHT THERAPY AND ELECTROTHERAPEUTICS

SPRIGGS, E. I.: The Examination of the Vermiform Appendix by X-rays. *Archives of Radiology and Electrotherapy*, March, 1919, xxiii, No. 224, p. 301.

This excellent and well illustrated paper is based on the study of over 300 cases in which the appendix was demonstrated in whole or in part.

### METHOD OF EXAMINATION

As a preliminary to the examination a cathartic, preferably castor oil, is administered thirty-six hours before the opaque meal.

The meal administered for the examination of the appendix consists of three-quarters of a pint, 425 c.c., of buttermilk in which are suspended from 1543.23 to 2314.85 grains (100 to 150 grams) of barium sulphate.

The examination is then made by two methods: *First*, by fluoroscopy with palpation by means of the gloved hand or with the aid of a wooden spoon, in order to observe the mobility, the presence and absence of active movements, the location of sensitive pressure points. In order to visualize the ileum and cecum it is necessary to manipulate these structures, to obtain a view of the whole appendix when possible. *Second*, radiographically: Several plates are made of the ileocecal fossa in order to study the form, shape, position, outline of the appendix. Radiographs are made in the horizontal position in the ventrodorsal direction; sometimes a semilateral position is required.

When the cecum lies in the pelvis the appendix can often be shown, but, generally speaking, its mobility cannot be tested. It is

possible, however, in most cases, to move the cecum into the iliac fossa by the following procedure. The patient lies on the right side and takes half a dozen deep breaths, then turns semi-prone on the right side, still breathing fully; he then lies on his back and the abdomen is stroked deeply from the symphysis pubis to the right iliac crest. Another means of moving the cecum out of the pelvis is to distend the rectum with air, the patient lying on the right side; authors have used this method, but have generally found it unnecessary.

If the appendix lies behind the cecum it can often be shown by taking an oblique view, or by moving the cecum to one side.

It is an advantage if the end of the ileum and the appendix can be shown filled at the same time. Should there be an opaque material in the ileum, but not in the terminal part, it will often be moved on into the terminal part if a drink of hot water be given, provided there is no obstruction to prevent the hot water leaving the pylorus. The patient should turn to the right side.

When there is pain, tenderness, or inflammation, movements and manipulations must not be made, or only made with great care.

A 2 mm. aluminum screen is interposed for both screening and plate exposures, using a Coolidge tube.

#### NORMAL APPENDIX

The shadow of the normal appendix may vary in width from one-quarter inch to a thread or consist merely of a row of dots. The lumen may be seen to fill and empty several times, especially in young people, and normally it should empty and fill at the same time as the cecum itself.

In those cases in which the appendix fills only in part or empties before it has completely filled, a succession of buttermilk meals at breakfast, lunch and tea time may fill it.

The appendix begins to fill soon after the material enters the cecum, that is, three or four hours after the meal has been taken, although in some instances the filling may not take place after the cecum and ascending colon are filled. The filling may be quite slow, or it may fill completely in a few minutes.

The material entering the appendix may appear as a shadow of the same breadth as if forced by the pressure of the cecum, and the material may be seen to pass along the lumen when the cecum is pressed. The tapering shadow of the contrast substance in the appen-



dix, and its rapid movement, would indicate that the contraction of the appendix with constriction of the basal part near the cecum moves the contrast substance to the tip of the appendix by a sort of peristaltic action. Under pathological conditions a wave of contraction may be seen extending from the base of the appendix to the apex. In such instances the contrast shadow shows as a round head toward the tip, tailed off toward the base where the wave of constriction is grasping it.

The width of the lumen varies considerably in different appendices in the same individual. Early in the study it may be relaxed and later on it becomes markedly constricted. It bears no relationship to the size of the cecum and the ascending colon.

The best view of the appendix is usually obtained in from twelve to fourteen hours after the meal and is as a rule visualized until the cecum is empty, surely not long after the ascending colon is empty. It may, however, empty when the cecum is still full.

The emptying of the appendix takes place by definite waves of contraction which pass from the tip to the base. Wave-like motions in the tip are probably due to a contraction of its wall or to the passage of material from the ileum to the cecum or from the cecum into the diseased appendix.

### THE DISEASED APPENDIX

In the diagnosis of chronic appendicitis authors have found direct x-ray examination of the appendix of great value, not only in cases in which suspicion has been cast upon that organ, but especially in the cases of vague abdominal symptoms of unknown origin; in many such it has been possible either to demonstrate a normal appendix or to show that it was, or had been, the seat of disease.

It is sometimes possible to make a diagnosis of chronic appendicitis from x-ray findings in the ileocecal region other than direct observations of the appendix. Such findings as adhesions of parts, ileal stasis, insufficiency of the ileocecal valve, and spasticity of the colon, have been put forward as affording contributory evidence of appendicitis. Adhesions about the appendical region are, of course, suggestive of former inflammation. Ileal stasis has been said to be present if the terminal ileum is not empty nine hours after the opaque meal. Such a definition can only apply if the stomach is empty in a

normal time, for the ileum cannot discharge its contents promptly unless it receives them promptly from the stomach. This fact has sometimes been overlooked, and ileal stasis has even been depicted in the literature by a photograph in which opaque material can still be seen in the stomach. As a working definition, authors speak of ileal stasis or delay if the terminal ileum contains opaque material more than four hours after the stomach is empty. It was present in 21 out of 35 cases operated upon; also in cases in which the appendix had been removed. But the examination of the appendix itself with the buttermilk meal gives more valuable information than can be derived from observations on surrounding parts made with those opaque meals which enter the appendix less often.

In the direct examination of the appendix the points to which attention must be paid are: (1) the filling or emptying of the appendix—delay or stasis; (2) shape—constriction and dilatation; (3) focal concretions—vacuoles; (4) mobility; (5) hyperactivity—spasm; (6) tenderness; (7) position.

#### THE FILLING AND EMPTYING: DELAY OR STASIS

The appendix may not admit any barium, or not enough to cast a shadow, either because it already contains inopaque material or because it is obstructed or obliterated. Constriction near the base, or obliteration, will, of course, account for some of the cases in which the appendix is not seen. But the authors do not consider it justifiable, in the present state of their knowledge, to conclude that one must regard with suspicion an appendix which does not fill, as failure to demonstrate the appendix in a person thought to be normal is unusual, especially if a second examination be made with three small buttermilk and barium meals, as described above.

Most frequently in chronic appendicitis the appendix fills in part, the passage of barium into the distal part being blocked, sometimes by obliteration or constriction or kinking, but generally by stagnant inopaque material which the appendix has been unable to expel, owing to limitations of movement due to inflammation or its results. Sometimes the barium mixes with this material, forming a fainter shadow.

In these cases there is delay in emptying, so that instead of the appendix emptying at about the same time as the cecum it retains

its contents twelve, twenty-four or more hours longer. Authors have seen barium remaining for twenty-six days, and it has been known to remain for several weeks.

An appendix showing prolonged stasis is one in which fecal concretions would be likely to form. If the shadow is very fine and the appendix rigid there is probably a fibrous atrophy.

#### SHAPE: CONSTRICTIONS AND DILATATIONS

Irregularity in the outline of the shadow is, next to uneven filling, the commonest sign of diseased appendix.

#### FECAL CONCRETIONS: VACUOLES

Concretions of long standing become infiltrated with lime salts, and cast a shadow which may be seen independently of an opaque meal. Such a shadow may be confounded with calculi in the urinary tract. It is usually a symmetrical oval, which may help to distinguish it from the shadows of calcareous glands and phleboliths. The lumen proximal to an old concretion is often bent into a sharp hook; indeed, a hoop-shaped end on the appendical shadows should suggest the possibility of a concretion.

More recent concretions, which cast no shadows of their own, may entirely block the passage of barium, in which case they cannot be recognized, although they may be suspected, in appendices of irregular outline, which fill in part only and show a hook. In many cases the barium passes round a soft concretion, which then gives the appearance of a vacuole. There may be more than one of these abrupt or gradual widenings of the lumen, which are constant in different photographs, alternating with narrow places. In other words, the barium extends around the proximal part only of the concretion, giving a v- or cup-shaped shadow.

#### MOBILITY

If the appendix cannot be moved about within the limits of its attachments, adhesions are suspected, except if the cecum and appendix lie in the pelvis. Adhesions of the appendix to other parts of the digestive tube can often be shown by manipulation, the adherent parts moving together. It is most often adherent to the iliac fossa, the ileum, the cecum, or in the pelvis. The appendix may fill



with barium, even when it is bound down for the whole of its length, where inflammatory membranes cover the appendix and cecum and constrict the ileum.

Sharp kinks must be noted carefully.

#### HYPERACTIVITY: SPASM

The normal filling and emptying movements of the appendix, which in the young are, like the mass movements of the colon, often vigorous and rapid, may be aggravated in older people by acute and subacute inflammation in those parts of the appendix in which gross changes have not taken place. In chronically inflamed appendices containing a fixed fecal mass offering resistance to free progress authors have observed vigorous waves traveling from the cecum toward the tip, but not in the reverse direction, even when barium lay distal to the obstruction.

Such pathological hyperactivity differs from the normal activity in that it is often continuous for hours during the filling period; authors have even seen it still going on after twenty-four and thirty-six hours.

Another characteristic appearance of the inflamed appendix is that of spasm. A particular part remains constricted for a considerable time, the blocks of opaque material being cut off abruptly, whereas when they are being moved on by waves of contraction they have tailed or rounded ends. Slight or varying dilatation of the lumen is nearly always present also. When concretions are present there is generally no spasm. A very thin small lesion may cause spasm and impair the rate of emptying.

#### TENDERNESS

Tenderness or pain on direct pressure over the appendix shadow may be a valuable and unequivocal sign of inflammation. An enlarged part of an appendix is frequently, although by no means always, painful on direct pressure. But, taken alone, tenderness is of less uniform significance than might be expected. It is not safe to make a diagnosis of appendicitis on the basis of tenderness in the absence of the more important signs mentioned above. If direct though gentle pressure is exerted upon the base of the appendix pain is often felt, usually at the spot pressed upon, but sometimes in the left side

of the abdomen. The temperament and general condition of the patient must never be forgotten in interpreting this diagnostic sign.

In a case of serious gastric disorder the appendix lumen was large, and filled and emptied naturally, but the patient complained of severe pain when it was pressed upon gently. He was *x*-rayed again after a fortnight, the same sign being obtained several times in each series of observations. At the operation the stomach was found to be the seat of a growth, but the appendix was healthy.

In summarizing it is stated that the signs of present inflammation are, in addition to pain and other clinical symptoms, a tender point, and varying dilatation of the lumen due to hyperactivity and spasm, while evidence of former disease, recent or remote, is given by concretions, abnormal outline, delay in filling or emptying, adhesions, severe kinks, and, in certain cases at least, by the absence of a shadow.

I. S. HIRSCH.

PFAHLER, G. E.: Malignant Disease of the Lungs, Its Early Recognition and Progressive Development, As Studied by the Roentgen Rays. *The American Journal of Roentgenology*, November, 1919, vi, No. 11, p. 575.

Pfahler states that in the earlier stages malignant disease of the lungs cannot be definitely diagnosed by any means. In its later stages it should, however, be apparent to every roentgenologist.

By reviewing the roentgenograms of a large number of cases, some of which had been followed over a period of several years, during which he had studied the progressive changes in the lesions, he has been able to trace the gross lesions back to their very incipency. He laments the fact that many patients are now operated on with the hope of complete recovery at a time when there is complete metastasis in the lung and mediastinum. It is for this reason that he suggests a procedure which has been operative in the Cancer Hospital, London, for many years, namely, the examination of the lungs preceding all operations for carcinoma of the breast.

He divides malignant disease of the lungs into primary and secondary. Primary malignant disease of the lung is rare. It is either of the nodular or infiltrating type. The nodular type is characterized by a development of nodules near the roots of the lung and near the parenchyma. These nodules vary in size, are sharply

defined and have somewhat rounded, irregular outlines. The infiltrating type, which is more common, gradually infiltrates the entire lung from the root outward. This infiltrating type produces only a few symptoms, so that the entire lung may be completely infiltrated, with marked displacement of the heart and mediastinal tissues to the opposite side, and pleural effusion, before any severe symptoms are present. If the malignant tumor is a sarcoma it is apt to extend outward along the septum between the upper and middle lobes on the left side or about the middle lobe on the right side. The primary carcinomata, however, infiltrate along the bronchial walls most frequently in an upward direction.

The secondary or metastatic malignant disease of the lung is much more common than has been recognized up to the present time. The author quotes Wartfield's statistics of the Carcinoma Hospital, London, in which he states that metastasis was found in the lungs of 178 out of 516 autopsies performed on persons who died from carcinoma of the breast and concludes that at least one-third of the patients dying from carcinoma of the breast have metastasis in the lungs.

But metastatic tumors of the lung may be metastatic sarcoma, hypernephroma, or carcinoma.

#### METASTATIC SARCOMA

The primary lesion in most of these cases is in the testicles. The lung lesions are nodular and occupy the parenchyma of the lung. They are generally sharply defined and may vary in size from one-fourth of an inch to two inches in diameter. Very few of these cases have any lung symptoms.

#### HYPERNEPHROMA

The lungs are a frequent seat of metastasis in this form of tumor. The lung tumor in these cases consists of a general infiltration, small, miliary bodies extending outward from the roots of the lungs, the lesions being more sharply defined than those due to tuberculosis and not having the same distribution as tuberculosis.

#### METASTATIC CARCINOMA

This commonly follows carcinoma of the breast. It may be of four types:



(1) *Nodular*.—There are numerous nodules generally distributed in the parenchyma of the lungs and sometimes about the roots of the lungs. They may vary in size from a pinhead to foci over an inch in diameter. They are not very dense, sharply outlined, and have a fuzzy appearance. They are less dense and less sharply defined than in a metastatic sarcoma. The density may approximate that of the heart.

(2) *Infiltrating Type*.—This type has its origin in the hilus or mediastinum. It first shows as a general thickening or infiltration about the hilus which in its early stages resembles inflammatory thickening but which differs slightly in that it presents more localized density without outline at the very roots of the lungs. It then shades so gradually as it extends outward that it is lost in outline. There is a greater tendency toward an extension upward about the upper bronchial tree and toward the upper lobe, usually found in inflammatory lesions where the tendency exists for the infiltration to involve the lower portions of the bronchial tree. The finding at this stage is only suggestive, not characteristic. As the disease progresses this area of density increases, extending toward the periphery, particularly toward the upper lobe. Associated with this there is a general increase in the width and density of the mediastinal tissues. In some cases such mediastinal thickening is greatest in the upper portion of the chest below the inner extremity of the clavicles and at times distinct masses can be recognized in this upper mediastinum. The location and general distribution and the development of the disease in these cases would indicate that there is a direct extension through the lymphatic system, just as the disease commonly extends through the glandular system into the axillæ, then into the supra-clavicular region, then into the mediastinum. Pfahler states incidentally that roentgenotherapy probably converts these lesions into dense fibrous tissue.

(3) *Miliary Infiltration Type*.—This type is very similar in its appearance to miliary tuberculosis, but the areas of increased density are a little larger, more dense and more sharply outlined than those of tuberculosis. It is difficult to differentiate this lesion from an inflammatory lesion, from tuberculosis, from an infiltrating syphilitic lesion or from an infiltration of the lung associated with leukemia. Clinical study must aid in a differentiation.

(4) *Progressive Thickening of the Pleura Associated with Pleural Effusion.*—This type is probably a direct extension of the disease from the breast and from the pleura by way of the intercostal spaces.

Of the 216 cases of carcinoma of the lungs which the author studied there were:

Primary carcinoma	2
Metastatic carcinoma	196
Primary sarcoma	7
Metastatic sarcoma	11

In the cases of metastatic carcinoma of the lungs the great majority were secondary to carcinoma of the breast.

Of the cases of metastatic carcinoma of the lungs there were:

Mediastinal and hilus involvement	150
Nodular	34
Miliary	10
Pleural	12

The author is also of the opinion that thin patients are slightly more liable to the nodular variety of metastatic carcinoma and that fat and medium patients are much more liable to metastasis than thin.

In general he believes that when the lungs are involved it must be looked upon as part of a general carcinomatosis, and with few if any exceptions, a complete and permanent recovery cannot be expected.

I. S. HIRSCH.

WILLIS, G. S.: Radium Therapy. *Medical Clinics of North America*, Sept., 1919, iii, No. 2, p. 401.

A brief review of the history and a description of radium are given. The therapeutic value is due to the emanations given off, and this constitutes a process of disintegration. The emanation disintegrates into what is known as the "active deposit of rapid change." From radium A, B, and C the Alpha, Beta, and Gamma rays are obtained. The power of penetration of the Gamma is very great and that of the Beta rays much less marked. Ewing's observations on the effect of radium in a series of uterine cases show that the cancer cells first

become swollen, then the nuclei homogeneous and hyperchromatic. Hydropic vacuoles appear in the cytoplasm, and by about the third week of treatment may have undergone liquefaction necrosis. The lymphocytes and proliferating stroma invade and compress the remaining cells. The active proliferating stroma becomes converted into granulation tissues, showing many newly found capillaries, which penetrate the tumor cell nests. Complete simple necrosis follows overaction of radium, and all manner of variations occur in the reaction following its use.

As in the treatment of malignant disease, the process is given thorough radiation and then removed surgically after a period of from three to six weeks. One effect of the radiation is to destroy the power of the cancer cells to reproduce, thus preventing metastasis. Additional radiation is given along the scar, surrounding tissue and lymphatic glands.

Radium toxemia is a condition always present to a varying degree following radium treatment. The patient may show a rise in temperature, a sensation of prostration, lowered blood-pressure, and rapid heart action. Nausea and vomiting may be pronounced.

A given routine examination of the patient is made before treatment, and during the exposures to radium, certain standing orders to combat the toxemia are observed.

H. WOLFER.

BROWN, L., AND SAMPSON, H. L.: The Early Roentgen Diagnosis of Ulcerative Tuberculous Colitis. *Journal American Medical Association*, July 12, 1919, xliii, No. 2, 77.

The article gives certain data which may aid in the early diagnosis of tuberculous colitis. The symptoms now considered characteristic of the disease are chronic persistent diarrhea, abdominal pain, tenderness and rigidity. But surgery, to be of any assistance, must be resorted to before these symptoms make their appearance.

Necropsy statistics show that intestinal tuberculosis occurs in from 60 to 80 per cent of those who have had pulmonary tuberculosis, the complicating enteritis and colitis hastening a fatal issue.

Extensive ulceration may be found at autopsy when no symptoms have occurred during life. The authors believe that when a patient even in the incipient stage of pulmonary tuberculosis fails rapidly



and shows no pulmonary symptoms and signs or a lessening of the signs and symptoms referable to the lungs, intestinal complications should be suspected. In these cases the cecum and ascending colon may occasionally be palpated, due to a slight thickening of the colonic walls. Pain is not an early symptom. Later pain below the epigastrium occurs irregularly, may be transient, often persistent, becomes crampy and stabbing in character, is aggravated by taking food, and is often relieved by fasting.

The stools are mushy; there may be tenesmus and griping. The disease may be manifested by the disappearance of a previous constipation. At first the diarrhea is transient. Diarrhea without intestinal ulceration occurs in from one-tenth to one-seventh of all cases of pulmonary tuberculosis. Diarrhea does not become persistent until the ulceration has extended to the cecum, ascending and transverse colons. The odor of the stools is fetid and penetrating. Intestinal hemorrhage is rare, but flatulence is common.

The sites of the lesions in 500 autopsies were ileocecum 85 per cent, jejunum 28 per cent, duodenum 3.4 per cent, ascending colon 51.4 per cent, descending colon 21 per cent, sigmoid 13 per cent, rectum 14 per cent (Fenwick and Dodwell). Archibald believes that those cases which have alternating constipation and diarrhea indicate involvement of both large and small intestine.

Of the numerous laboratory tests evolved none are pathognomonic of intestinal tuberculosis.

The frequency of abdominal symptoms in pulmonary tuberculosis is well recognized, but a diagnosis of intestinal tuberculosis cannot be positively made by their presence, unless aided by roentgenologic study.

The first in American literature to study the hypermotility of the cecum was Pirie. He noted that the tuberculous cecum retained none of the barium which should normally have accumulated there.

The technic employed by the authors is as follows: On the day previous to the roentgen examination, the patient abstains from taking a laxative. A barium suspension is given on an empty stomach. The formula used is 1 tablespoonful of cocoa, 1 tablespoonful of sugar, 1 tablespoonful of flour, 4 ounces of barium, and milk to make 16 ounces. The stomach is not examined during the ingestion of the meal, but six hours later a fluoroscopic and roentgenographic examination is made, as the cecum and ascending colon are usually visual-

ized at this time. An examination every half hour for an hour or two may be necessary to partially or wholly visualize the cecum. If possible, examination is made after eighteen hours, but always after twenty-four hours. A day or two later, after the administration of 1 ounce of castor oil, a barium enema is given and a plate is made in the prone position.

The first pathological variation in intestinal motility noticed by the authors was the rapidity with which the barium meal passed through the large intestine, complete evacuation occurring in from twenty to twenty-four hours. In many cases the head of the column was in the sigmoid and rectum after six hours, with a small residue in the stomach. In many cases the cecum was the site of a definite hypermotility. In none of the cases later operated upon which proved to be tuberculous were they able to visualize a well-filled cecum. In some of the positive cases they noted ileal stasis.

The second important observation is the irregular and ragged appearance with absent haustral markings.

With the barium enema examination under the fluoroscope the barium mass moved slowly until it reached the suspected portion of the intestine, where it stopped. It was necessary to increase the pressure to fill it out and then it was irregular in outline. The radiographs showed definite filling defects.

The authors believe that no condition other than intestinal ulceration produces this picture.

The results of the examinations of 110 cases are tabulated.

Among the negative and doubtful pulmonary cases there was no roentgenologic evidence of intestinal tuberculosis. Of 11 incipient pulmonary cases, 7 were negative, 1 was doubtful, 3 were positive.

Of 68 moderately advanced pulmonary cases, 44 were negative, 15 doubtful, and 9 positive; of the latter 4 were proved at operation, the other 5 not operated on.

Of 22 far advanced pulmonary cases none were negative, 5 were doubtful, 17 positive; of the latter 9 were verified at operation, 3 died and 5 were not operated on. In many cases the operative findings tallied with the diagnosis as to site and extent; other cases revealed more extensive ulceration than was indicated by the plates and screen. So far the authors have not been able to diagnose tuberculosis of the small intestine by the roentgen method.

I. S. HIRSCH.

WILKINS, W. A.: The Diagnostic Value of the X-ray Examination in Pulmonary Tuberculosis. *Canadian Medical Association Journal*, April, 1919, ix, No. 4, pp. 333-338.

X-ray plates and fluoroscopic examinations are valuable aids in diagnosis, but must not be considered as decisive as they are in cases of fracture or dislocation.

One possibility of error lies in the fact that even in non-tuberculous lungs some degree of pathology is found. Shadows are observed at the roots of the lungs, along the course of the bronchi and bronchioles, and at points of bifurcation wherever there is branching of the bronchial system. They are cast by the lymphatics and blood-vessels of the system and by lymphoid elements at the root of the lungs. There are normal findings, but their visibility on the plate increases with age, and with the extent to which they are involved by pathological processes. "When one considers the impurities that are constantly being inhaled it is not surprising that the lymphatic system, associated with the respiratory tract, should almost always show some evidence of pathology, but it cannot be termed strictly an evidence of disease. Hence occupation, environment and age, apart from disease, will affect the degree to which these shadows are present. . . . When the areas drained by the lymphatics which filter through the glandular structures, or the glandular structures themselves are diseased, resulting in increased infiltration, these shadows will be increased in extent and density. . . .

"The quality of the shadow is a matter of extreme importance, varying with the age of the lesion. Old lesions are dense. In recent invasions, or in an active lesion, the shadow is generally light, feathery and small in extent, and a favorite situation is in the upper portions of the lungs, either supra- or intraclavicular."

Another kind of shadow consists in small, more or less circular, circumscribed and sharply defined shadows which may be found anywhere from the root of the lung to the periphery, and from the base to the apex. They seldom bear any relationship to physical signs or to the state of health of the individual. The blurring of one of these shadows may suggest the probability of active disease, but as a rule they merely represent an old healed lesion.



Cases may be divided into four groups: The *first group*, namely that in which evidences of tuberculosis are manifested by clinical examination and by the *x-ray*, includes the greater number of cases.

Advanced cases with copious signs and heavy shadows require no skill to recognize. The *x-ray* frequently reveals a greater extent of disease than the clinician believed to be present. This is due to the fact that the deeper lesions cannot always be demonstrated by clinical methods. Yet even the *x-ray* cannot reveal all lesions completely and additional pathological factors may be discovered at autopsy.

The *second group*, including cases in which diagnosis is based upon clinical evidence alone, should be a small one. They are early cases and the lesions are situated superficially, or are too small to project recognizable shadows—*i. e.*, they can be discovered only with the aid of a microscope.

The *third group* comprises "cases in which diagnosis is based upon *x-ray* evidence, in the absence of physical signs in the chest. Some clinical evidence of disease is present, such as elevation of temperature, rapid pulse or cough, but the clinician . . . is unable to locate the site of the lesion by ordinary physical examination. However, it is unwise to establish a diagnosis of tuberculosis upon the *x-ray* findings alone, in the absence of corroborative clinical evidence."

The *fourth group* includes doubtful cases in which physical and *x-ray* examinations yield negative findings, but in which a definite diagnosis of tuberculosis is later established. This group is fortunately small.

The author says in closing that errors in *x-ray* diagnosis are seldom due to lack of evidence on the plate, but to lack of skill in interpreting the evidence. There is danger of regarding the normal pathology as an evidence of active tuberculosis. "No method of examination, nor combination of methods, will give rise to results 100 per cent correct. The margin of error will grow smaller with increasing experience, but it is too much to hope that it will ever disappear entirely."

STEPHENSON, F. B.: Roentgenologic Evidence of Early Pulmonary Tuberculosis. *Colorado Medicine*, March, 1919, xvi, No. 3, pp. 61-66.

The author quotes E. H. Heise and H. L. Sampson (*Amer. Rev. Tuberculosis*, vol. i, 1917-18, pp. 713-716), as saying: "The x-ray would show us that roughly one-half of the incipient cases are of the patchy or parenchymatous type, probably a more advanced or a more unfavorable lesion than the peribronchial type, or the expression of a different kind of infection, either as to time (previous sensitization) or as to route of infection, or both."

Other writers also distinguish between tuberculous peribronchitis and periacinous (parenchymatous) tuberculosis, and find the two conditions to be distinct in their clinical course.

Groedel is quoted as saying: "Evidence of a fresh process is indicated by small flecks with tendencies to coalesce." Holmes says: "A pathological process in the lung structure tends to produce changes in the lymphatics draining the infected area. Therefore we should expect to find a shadow in the lung substance representing a site of the pathological process, and a fan-shaped area of thickened linear markings representing the course of the lymph-channels draining the area. The peribronchial glands in the infected area may also show changes. . . .

"The third (parenchymal) is the most common type and is seen as an insulated group of small white areas, usually near the periphery of the lung, from which spreads a fan-shaped area of thickened linear markings which extend toward the hilus. Thickened and mottled markings in the region of the bronchi may also be seen, as well as large and possibly calcified peribronchial glands. As the process increases and the areas become larger the shadows tend to overlap and the typical fan-shape is lost. . . . It is of special importance that the position of the group of small areas of increased density, which represent a group of tubercles, be accurately located. If it can be stated that these shadows are in the periphery of the lungs, great weight should be placed upon their presence. If, however, they are along the bronchi, the process may be only glandular."

According to Major E. V. Davis, "pulmonary tuberculosis is demonstrable on the roentgenogram even in its earliest shapes. Success in demonstrating the tuberculous lesion depends upon the technic and upon the keenness of the observer." The most definite

signs of active pulmonary involvement are soft, fuzzy, flaky shadows within the outline of the normal lungs. "When these shadows are found at the periphery and are mottled, we consider them characteristic of the acute, active tuberculous lesions. The soft shadows are interpreted as tubercles with areas of congestion about them, and the thickening of the trunks as lymphatics draining the infected area. Soft mottling in the apexes with peribronchial thickening leading to it we consider the most definite sign of active phthisis presented on the roentgenogram."

M. E. Lapham (*N. Y. Med. Jour.*, Feb. 16, 1918, p. 294) has summarized her findings in 150 x-ray examinations of children as follows: "The first abnormal conditions are seen in the enlargements of the bronchial glands . . . the second set of changes consists in thready infiltrations running from the root of the lung up toward the apex. In successive stages the bronchial glands become larger, with sometimes a central lighter area which suggests softening; the thready infiltrations become more and more massive, mottling and circumscribed nodules are seen, until finally the typical picture characteristic of undoubted tuberculosis is presented."

Oberend and Hebert (*Arch. Radiol. and Electrother.*, Dec., 1917, p. 193) find the initial lesions in early stages to be minute peribronchial or periacinous foci which vary in size from that of a millet seed to that of a pea.

E. S. Blàure (*Ill. Med. Jour.*, March, 1914) considers that tuberculous lesions can be detected more quickly by roentgen-rays than by other clinical methods. But when shadows are present representing pulmonary involvement the condition is no longer incipient but advanced.

According to G. C. Johnston (*Amer. Jour. Roent.*, July, 1918, p. 323): "If the disease is active, tuberculous areas will be smoky, foggy, hazy, blurred and indistinct. If disease is quiescent, the plates will show sharp demarcation, sharp contrast, dense small shadows, no fog, no smoke nor haze. Dense shadows of regular outline and sharp demarcation denote healed processes."

H. Durhm (*Amer. Rev. Tuberculosis*, Nov., 1918) describes the tuberculous lesion as being shaped like a cone with its base toward the lung periphery, projecting a fan-shaped shadow on the plate. If the fan appears closed, healing is taking place, if it is wide open, the disease is active.



The *U. S. Army X-ray Manual* (1918, p. 378) states that the early lesions of tuberculosis appear in the upper lobes usually just below the clavicle. They usually appear as a group of faint homogeneous shadows, indistinct in outline, varying in diameter from several millimeters to a centimeter. The pathological basis of the shadows is probably an agglomeration of tubercles surrounded by a pneumonic exudate. As the lesions progress the shadows increase and coalesce, forming a large homogeneous shadow. Caseation appears as an increase in the density of the shadows, which become more distinct and irregular in outline. The development of fibrous tissue is generally noted as the appearance of fine strands in the infiltrated area.

A diagnosis based upon x-ray evidence alone is not infallible, but this evidence, combined with other clinical findings, is capable of revealing pathological changes not demonstrable by other methods alone.

The author emphasizes the importance of good technic and experience in making x-ray readings.

## SECTION ON NEUROLOGY AND PSYCHIATRY

NATHAN, D.: Hysteria. *The Boston Medical and Surgical Journal*, January 15, 1920, clxxxii, No. 3, p. 66.

Hurst's definition is judged to be the most apt of those recently suggested, namely: "Hysteria is a condition in which symptoms are present which have been produced by suggestion and are curable by phychotherapy." There are no constant physical or mental stigmata. Every symptom has a physical basis at first; later on its perpetuation is hysterical. An example of this is shell shock. Many cases were seen at the hospital where the author was stationed. They had been massaged, manipulated, electrified, bathed in minerals, and given up as disabled. In a series of 100 cases, exclusive of aphonia, the average period of treatment in other hospitals was eleven months. Of this series 96 were cured at one sitting, 1 in four days, 1 in four weeks, and 2 in eight weeks. Of 67 cases of aphonia following gassing, emotion, wounds of neck and chest, with an average period of treatment of two hundred and five days in other hospitals, 37 were cured in five minutes, 21 within half an hour; 9 required more than half an hour. The patient was always assured of a cure.

M. M. BANOWITCH.

LUTZ, A.: The Eye Symptoms in Pseudotumor Cerebri. *Archives of Neurology and Psychiatry*, 1919, ii, 539.

Dr. Lutz's paper may be divided into three parts: In the first he gives a brief summary of our knowledge to-day regarding pseudotumor cerebri (Nonne); it includes Definition, History, Clinical Aspect, Anatomic Findings, Differential Diagnosis, Prognosis, and Therapy. The deductions are based on 46 cases controlled by ne-

cropsy and on 41 which ended in healing and which had been long enough under observation (three years) to assure their acceptance as bona fide cases.

The second part of the paper deals with the various eye symptoms. Lutz finds that choked disk, mydriasis, nystagmus and paralysis of the abducens are the most constant eye symptoms in pseudotumor cerebri, and that all these symptoms recede in the cases which are healed. This is especially remarkable with choked disk, spontaneous retrocession of which is unknown in genuine brain tumor. Lutz concludes that this spontaneous retrocession of choked disk therefore strongly indicates pseudotumor cerebri: in nearly 50 per cent of the cases which were healed, the congestion receded so completely that neither ophthalmoscopic nor visual examination could detect a trace of the former disease of the disc. He further makes mention of some cases where choked disk appeared a second time, and even a third time, after intervals of months or years. Ear ailments were noted in various cases, and deafness developed, as a rule, one or two years after the disease set in; only in 1 case did deafness appear as a first symptom.

The third part of the paper gives the history of the author's own observation: "A woman in the prime of life falls suddenly ill, without any increase of temperature or signs of meningitis infectiosa, presenting all the symptoms of brain tumor: choked disk, headache, vertigo, vomiting. These symptoms, after having appeared most alarming for fourteen days, slowly recede, including the choked disk, so that four weeks later the patient feels normal. In the subsequent two years a unilateral deafness develops, followed one year later by the unilateral loss of the vestibular function, and from time to time attacks occur which tend to show an alteration in the left cerebellopontine angle. The patient shows (at present) indications of the unilateral Romberg sign, which can be explained by unilateral lesion of the homolateral tractus spinocerebellaris. Pseudotumor can only be diagnosed with certainty by necropsy. If in this case we do not make the diagnosis of benign tumor of the cerebellopontine angle, but incline to that of pseudotumor, it is for the following reasons: sudden onset of the disease; retrocession of all the symptoms within a short time, especially of the choked disk; negative reactions of the cerebrospinal fluid and increase of its quantity; the fact that



the unilateral deafness did not appear as a first symptom; the absence of a constant progressive paralysis of the other cranial nerves; the increase of the patient's weight; and finally, the time elapsing since the first attack."

Lutz discusses the different diagnoses which could be made of this case, which was observed for over three years. He calls special attention to the retrocession of the choked disk to the normal, and the separate destruction of the left acusticus and the left vestibularis, and illustrates this by a small sketch of the cerebellopontine angle.

S. E. JELLIFFE.

MAAS, OTTO: Klinisch-anatomischer Beitrag zur Kenntnis systematischer Linsenkerndegeneration. *Neurologisches Centralblatt*, Jan. 2, 1917, xxxvii, No. 1, p. 16.

As a result of exhaustive clinical and anatomical study Wilson has given us the picture of "progressive degeneration of the lenticular nucleus." Somewhat similar cases were described before Wilson's time and others have been published since under the name of pseudosclerosis, the name chosen by C. Westphal because of the fact that the clinical picture suggested the diagnosis of multiple sclerosis while section of the central nervous system revealed none of the essential features of this disease. The author presents a case with extreme trembling as the most pronounced clinical symptom, which he at first took to be pseudosclerosis or diffuse sclerosis, all other clinical symptoms being against the assumption of multiple sclerosis. The histological examination, however, revealed bilateral degeneration of the lenticular nucleus corresponding to Wilson's findings. Nothing pathological was discovered in the thalamus and nucleus caudatus. Clinically, however, the author's case differs in some points from the cases described by Wilson, but the clinical pictures of both lenticular degeneration and pseudosclerosis, as presented by Sawyer, Stöcker, Cassier, C. Westphal and others, are not constant, although all agree that the main symptoms of both diseases are extreme trembling and muscle rigidity. Reviewing all the observations published, the author is of the opinion that clinically lenticular degeneration cannot be distinguished from pseudosclerosis. As for the anatomical findings—usually described as pseudosclerosis—nothing essentially sig-

nificant was found in the brain, but many of the cases were of earlier periods, and no thorough examinations for glia-cells were made. Alzheimer's finding in pseudosclerosis is important, namely of moderate sized glia-cells scattered throughout the brain, giant glia-cells with large plasma areas, principally in the basal ganglia and nucleus dentatus of the cerebellum, glia-cells in smaller numbers in the cerebrum, and isolated glia-cells in other parts of the brain. A. Westphal, in his case of pseudosclerosis, found glia-cells of moderate size, and places particular emphasis on the absence of giant glia-cells. The strong glia proliferation without vessel changes is common to both cases, corresponding with both the author's findings and Wilson's. In these latter findings the histological changes were situated principally in the lenticular nucleus, while Alzheimer and A. Westphal found glia proliferation in other sections of the nervous system, as did also Stöcker, who, nevertheless considered his case to be one of lenticular degeneration of the nucleus, and emphasized the similarity of his findings to those of Alzheimer in his case of pseudosclerosis. The circumstance that in cases of lenticular degeneration other physical symptoms, such as affections of the spleen and other glands, are seldom absent, also goes to show that the disease processes are not limited exclusively to the lenticular region. In the author's opinion we are justified in considering degeneration of the lenticular nucleus and pseudosclerosis as identical. Degeneration of the lenticular nucleus is also related to another disease, i. e., dystonia musculorum progressiva. No thorough histological examination of this disease, so far as the author knows, has been made, and it is therefore impossible at present to establish its identity with degeneration of the lenticular nucleus.

S. E. JELLIFFE.

TILING, E.: Klinischer Beitrag zur Pathogenese der Basedow-Erkrankung bei Kriegsteilnehmern. *Monatschrift für Psychiatrie und Neurologie*, 1918, xliii, pp. 123-193.

The author attempts to outline the relationships between the various hyperthyroid signs as seen in soldiers and the physical and psychical factors which might be evoked to explain them. He adheres to Oswalds hypothesis that the thyroid exerts its chief secre-

tory function on the basis of neurological stimuli. This secretion also increases the sensitiveness of the nervous apparatus, both sensorimotor and vegetative. Increased depressor tonus causes increased secretory activity. Thus a vicious circle is established whereby the thyroid, being interposed in the chain, brings about an increase in the symptoms originally aroused by the depressing emotions. In this way the original fear reaction causes increased sympathetic activity with increased thyroid secretion which increases the reactivity to the stimulus, and so the circle goes on. Seven cases are analyzed in which the psychogenic factor first starts the reaction; this arouses the vegetative functions, and the thyroid secretion is increased—and so on as related. The author also shows how, in some cases, there is primary disease of the thyroid in the nature of an inflammatory or neoplastic nidus. Thus there are psychogenic and thyreogenic hyperthyroid cases and intermediary mixed forms.

S. E. JELLIFFE.

GOSLINE, H. I.: The Rôle of Tuberculosis in Dementia Precox. *The Journal of Laboratory and Clinical Medicine*, Jan., 1919, iv, No. 4, pp. 186-214.

No conclusive data have been found concerning the relation of tuberculosis to dementia precox, and yet, of 30 cases of dementia precox studied by the author, 73.3 per cent died of tuberculosis. There is always the danger of a mistaken diagnosis, due to the difficulty in distinguishing microscopically and macroscopically between tuberculosis and syphilis, and between paresis, dementia precox, and alcoholism.

The author's study is based upon 30 cases which came to autopsy, all of them practically certain cases of dementia precox. Of these, 22 had died of tuberculosis, chiefly pulmonary.

The author gives case histories showing the onset and progress of physical and mental symptoms, followed over many years.

In many cases the onset of the physical symptoms coincided with that of the mental symptoms. Even when mental symptoms appeared years before the onset of physical manifestations, the increase and subsidence of the physical symptoms, such as rise in temperature, emaciation, râles, etc., was reflected in a parallel increase and wane



in mental abnormalities, such as excitement, active hallucinations, violence, etc.

On the basis of these cases the author concludes that "there is a group of cases of dementia precox in which tuberculosis may be considered to be a causative factor, and, possibly, the causative factor.

"Of such a group, 73.3 per cent die of tuberculosis. In 56.6 per cent the courses of the mental and physical disease run parallel, and in the other 43.3 per cent, which is the percentage which recover and die of later tuberculosis, or of some other cause, a previous or concurrent tuberculosis is demonstrable.

"Special complement-fixation tests on the blood and spinal fluid, and special cultural methods applied to such cases, should yield a high percentage of positive results and give us an added advantage in early diagnosis."

REICHARDT, M.: Zur Frage der pathologisch-anatomischen Grundlage der reflektorischen Pupillenstarre. *Neurologisches Centralblatt*, Jan. 2, 1918, xxxvii, No. 1, p. 7.

Uthoff has presented a case where there was typical unilateral pupillary rigidity with preserved convergence motions, in an individual with a bullet wound on one side of the seventh cervical vertebra, syphilis being excluded. He was unable to account for the persistent rigidity of the pupil because he regarded the only explanation for typical loss of pupillary reflexes with preserved convergence to be an interruption of the fibers controlling the light reflexes after they branch off from the optic tract up to the nucleus of the oculomotorius (rectus internus muscle). For those, however, who are of the opinion that certain localized lesions of the spinal cord may produce reflex pupillary disturbances there is nothing surprising in Uthoff's case. It is only necessary to assume that, proceeding from the lesion in the lower cervical or upper dorsal portion of the spinal cord, a tubular extravasation has extended along the posterior column or to the region of the central canal, or has occurred at this location as a result of a commotio spinalis which has healed through cicatrization. Uthoff's case opens anew the question of the pathologico-anatomical ground for loss of pupillary reflexes, and shows the necessity, in traumatic injuries, especially of the cervical regions, for ex-

amination of the pupils, systematically and continuously, until recovery, that is to say, until the establishment of a stable neurological condition, or, in fatal cases, until death. Notwithstanding the general neglect of pupillary examinations in lesions of the cervical cord, there is some evidence at hand of pupillary disturbances due to traumatic lesions. The evidence is much strengthened when the non-traumatic, more or less diffuse, diseases affecting these regions are taken into consideration. In 1903 the author gave a list of such cases from the older literature, which furnish irrefutable evidence of a close relation between the cerebral cord and the pupil-innervation. He now adds cases from the recent literature published by Syllaba, Siemerling, Fisher, and others. He concedes that the experiments made by Trendelenburgh and Bumke on cats would have to be taken as strong evidence against the cerebral cord and oblongata theory for loss of pupillary reflexes if it were proved that the conditions of innervation of the pupils in animals were not possibly, indeed probably, different from those in man. The author comes to the conclusion that, until the contrary is proved, we must always reckon with the possibility that lesions in various parts of the central nervous system may lead to disturbances of pupillary reactions produced in a manner resembling that in which spastic phenomena occur that are due to changes variously localized in the central system. Besides there is an isolated rigidity of the pupil to light, also probably of reflex character, where the posterior columns of the spinal cord are normal (cerebral, pupillary rigidity in contrast to spinal), just as there are, for example, extreme spastic conditions in affections of the pyramidal tract which are not anatomically recognizable. If the numerous cases of diffuse injuries of the superior cervical segments of the cord with accompanying pupillary rigidity, cited by the author in support of his theory, are not all to be taken as errors in observation or as due to possible luetic complications, then, in spite of Bumke's objections, the medulla theory is so far supported that further tests are desirable and necessary. Only facts can decide this important scientific question, and the author requests his colleagues to coöperate with him in its solution by making exact and consequent observations of pupillary conditions in all injuries of the superior cervical region.

S. E. JELLIFFE.





# INTERNATIONAL MEDICAL DIGEST

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# INTERNATIONAL MEDICAL DIGEST

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## SECTION ON GENERAL MEDICINE

McCAsKEY, D.: Quartz Ultraviolet Therapy and Kinetic Energy.  
*New York Medical Journal*, Dec. 27, 1919, ex, 1058.

The author states that it has been known for some years that cellular protoplasm, under the microscope, while transparent to the rays of sunlight, becomes opaque when ultraviolet rays are thrown upon it, *i. e.*, that protoplasmic structure absorbs ultraviolet light. The application of these rays to the skin is followed by heat, pain and swelling—the phenomena of sunburn. Larger doses are followed, in addition, by symptoms of metabolic disorder analogous to an anaphylaxis, *i. e.*, loss of appetite, chilliness, lowered blood-pressure, fatigue, and the symptom-complex of surgical shock.

It is also known that ultraviolet light affects the acetone components of metabolism by increasing their decomposition to gas formation. The application of quartz ultraviolet rays to the human body invariably raises the individual's oxidation to a higher percentage. In the case of a patient free from diabetes, whose urine shows a proportion of urea nitrogen to total nitrogen of 50 per cent, this proportion will, after several months' treatment with quartz ultraviolet light, be augmented to 30 per cent. The ordinary notion that diabetes is a disease of suboxidation is not borne out by chemical facts, for invariably the urine oxidation index of this type of endocrine breakdown is above 85 per cent urea nitrogen to total



nitrogen. A quartz ultraviolet light stimulates the oxidizing power of the synthetical forces of the body, and as in the author's opinion diabetes represents a process of superoxidation, ultraviolet light can not be administered to a diabetic as long as his metabolism is not in chemical equilibrium.

Once the blood-sugar has become normal, the use of small graduated doses of light will be of marked benefit. As long as the acetone components of metabolism are increased or activated by ultraviolet light to a decomposition state of increased gas formation, this form of treatment is contra-indicated. The amount of sugar in the urine is not to be depended upon as an index of endocrine efficiency. Not until the blood-sugar is normal is it advisable to change the diet of a diabetic patient, and even then the diet must be carefully graduated and scaled.

The studies of the effects of ultraviolet light on the amino-acids, on albumin, on bacteria, and on the red blood-corpuscles, as worked out by various observers, have proved beyond doubt that ultraviolet light has as much a place in our therapeutic armamentarium as fresh air, pure water, properly balanced food, sleep and recreation. Its germicidal power is utilized in both local and systemic infections.

From his own work McCaskey is convinced that a patient's reconstruction and restoration to a healthy metabolic equilibrium is chiefly due to the evolution of the forces stored up and at times liberated by ultraviolet absorption, just as in the chlorophyl system in plant life. Without going into the detailed technic of the administration of this therapeutic agent, he says it is sufficient to state here that the endocrine system of internal secretion glands is compelled to raise its standard of efficiency and also to produce a better degree of coördination. Better oxidation occurs as a natural sequence, hemoglobin is increased, high blood-pressure and uric acid percentages are reduced and acidosis relieved, provided the treatment is persistently applied for many months.

As a routine measure before applying the rays the author studies carefully the blood chemistry of his patients, including the Wassermann reaction, the functional efficiency of the kidneys, the blood-pressure, body weight and, by means of the electrocardiogram, the latent energy possibilities of the heart-muscle. Such studies are made every six or nine months, and the data obtained are scrutinized with a view to determining to what degree improvement has occurred.

For every physician who expects to employ ultraviolet rays in disordered metabolism, McCaskey lays down the following rules:

- (1) Determine the exact strength of the quartz burner.
- (2) Know the distance and time doses.
- (3) Watch carefully the patient's reaction for twenty-four hours.

Vinegar, boric acid, and ether sprayed on the inflamed erythematous surface, and hot baths, are useful aids, and give subjective relief. Allow and encourage radiation by avoiding heavy bed covers or thick underwear.

(4) As fast as one rayed area has completed its cycle of sunburn phenomena, move on to another area of the body and bear in mind that the entire spinal area is the core of the sympathetic nervous system. Constant dosing in this region after the skin has become tanned will improve the general condition of the nerves, muscles, digestive secretions, and special organs, and by semi-annual examinations of the patient's blood chemistry, urine oxidation and electrocardiogram voltage, the vitality index of the body may be raised to its maximum functional capacity and maintained there.

M. KESCHNER.

HERRICK, W. W.: Treatment of Meningococcic Infections. *Southern Medical Journal*, October, 1919, xii, No. 10, p. 588.

The author points out that the mortality from meningococcic meningitis has declined from 70 to 90 per cent in the earlier epidemics to from 15 to 30 per cent in the more recent ones. This decline, he says, is not due to a diminution in the virulence of the infection, but to more effectual treatment in general, and to specific serum treatment in particular. In an experience of 340 cases, he has also been impressed with the modern tendency to "focus the entire attention upon the serum" and "to neglect some general measures."

Herrick orders for each patient complete isolation in a quiet, easily darkened room, with light that does not shine in his face. He finds that the patient is more comfortable in a single, narrow, high bed with a single small pillow, or with none at all. An initial purgative is desirable. The skin must be taken care of, to prevent bed-sores. Cold baths and sponges, however, should be avoided. The bladder must be watched carefully, and if catheterization is resorted to it is to be

carried out with strict asepsis and should be followed by the administration of  $7\frac{1}{2}$  grains (0.492 gram) of hexamethylenamin four times a day, in a large quantity of water (adult dose).

The extreme irritability, headache and apprehension in the early stages of the disease are best allayed by morphin. An adult may be given  $1/6$  grain (0.01 gram) as often as is necessary. This drug is of value not only on account of its anodyne effect but also on account of its tendency to prevent serious immediate serum effects. As an aid to the morphin, chloral hydrate, from 15 to 20 grains (0.972 to 1.3 gram), with or without sodium bromid, 40 grains (2.6 grams), may be given two or three times a day. While an ice-cap on the head may help to control the headache, it has no specific effect upon the disease (and if it makes the patient uncomfortable it may safely be dispensed with—Abstr.).

Patients should be persuaded to take a sufficient amount of food. It need not all be fluid, and should be given at least every three hours. Inasmuch as the bodies of those dying from meningococcic infections almost always show dehydration at autopsy, an adequate intake of fluid during the disease is of paramount importance. It may be necessary to resort to hypodermoclysis or to infusion of saline solutions, to meet this indication.

The eyes are to be shielded from strong light, but otherwise left alone. If meningococcic conjunctivitis is present, the conjunctiva is to be washed gently every two hours with a saturated solution of boric acid and 1 or 2 drops of a 20 per cent solution of argyrol, to be instilled two or three times a day.

In the intervals a 50 per cent solution of antimeningococcic serum may be dropped into the eye with good effect. Cold compresses on the eyes are also very beneficial.

The frequent presence of the virus in the mouth, nose and throat necessitates great care in the collection and disposal of all discharges from these sources. This is important both for the patient and for those in attendance upon him.

At this point in his article Herrick calls attention to the fact that meningococcic infection may be said to have three stages:

(1) Local, in the nasopharynx, tonsils, nares, accessory sinuses or conjunctivæ.



(2) General, *i. e.*, an invasion of the blood stream—meningococcic sepsis.

(3) Local involvement of the meningeal membranes; this occurs in 95 per cent of the cases with or without involvement of the joints, lungs, eye, pericardium and other organs.

The clinical picture of the first or so-called carrier stage shows nothing specifically diagnostic, and the condition can only be recognized by culture. The treatment is purely local. Dichloramin-T in 2 per cent solution is useful as a nasal and pharyngeal spray. Normal saline solution, mild alkaline antiseptics, or 30 per cent peroxid, may be employed with equally good results. Stubborn cases may yield to undiluted antimeningococcic serum applied locally. The majority of carriers are cured by "time." About 1 per cent of them will not respond to any kind of treatment. These are undoubtedly cases with inaccessible foci in the nasopharynx, adenoids, or accessory nasal sinuses. These foci can best be dealt with surgically. It must, however, be borne in mind that local surgical procedures in such cases may result in general systemic infection. Some of these resisting chronic carriers have received injections of from one half to one million dead meningococci subcutaneously twice a week for two or three weeks, with little result, because, in the opinion of Herrick, the chronic carriers vaccinate themselves continually from the focus of infection which they harbor.

The second and third stages may overlap each other. Pure meningococcus sepsis, being difficult to diagnose, is frequently overlooked. Its average duration is forty-eight hours; it may, however, be transient, may be prolonged for days or weeks, or it may merge into the third stage from which, owing to the features of a general infection with a normal cerebrospinal fluid, it may be impossible to differentiate it.

The therapeutic aim of the premeningitic stage of sepsis is to sterilize the blood serum by giving large intravenous injections of antimeningococcic serum. To guard against the possible untoward effects of large intravenous injections of the serum, Herrick advises the following procedure: 0.01 c.c. of horse serum is injected into the skin of the forearm until a small welt is raised. The same quantity of a normal salt solution is injected into the same part of the limb about two inches from the site of the first injection, as a control. If



the patient is sensitive, an urticarial wheal appears at the point of injection of the serum. Within a few minutes this wheal may attain a diameter of two inches or more. Its absence does not rule out sensitization. If the test is negative, from 0.5 to 1 c.c. of serum is injected subcutaneously as a desensitizing dose. If, however, the test is positive, greater care is necessary, and only 0.1 c.c. is injected. If no symptoms result, 0.5 c.c. is injected thirty minutes later, then 2, 6 and 10 c.c. at half-hour intervals. If no untoward effects follow these injections, intravenous treatment may safely be begun.

Desensitization may be aided by hypodermatic injections of from 0.01 grain to 0.02 grain (0.0006 to 0.0013 gram) atropin sulphate (adult doses) half an hour before the intravenous injection is given. Morphin may also be administered by hypodermatic injection in doses of from  $1/6$  to  $1/4$  grain (0.01 to 0.016 gram) to allay the restlessness of the patient. Herrick never omits the atropin in any case. One hour after the desensitizing injection in subjects with a negative skin test, or one hour after the injection of 10 c.c. without reaction in sensitive subjects, the first intravenous injection may be given. Although the serum may be given pure, it is safer to dilute it with equal parts of normal salt solution. The simplest apparatus is a 20 c.c. Record or Luer syringe. In adults the vein at the elbow is the most convenient site; the external jugular may also be used. In infants the serum may be given by way of the longitudinal sinus, which is reached through the anterior fontanel.

The first 15 c.c. should be injected at a rate not exceeding 1 c.c. per minute; if no serious results follow this slow injection, the remaining serum may be given at a much more rapid rate. The injection of 100 c.c. need not take more than thirty minutes. While the first 15 c.c. are being injected it is well to be alert for immediate serum effects. These may be manifested by dyspnea, collapse, pain in the precordium, restlessness, rapid, weak, irregular pulse, cold sweat, nausea, vomiting and urticaria. If these symptoms are slight the injection may be continued, but if they are more severe the injection should be stopped and another attempt made in an hour or two. If the manifestations of anaphylaxis do not cease when the injection is stopped, from 10 to 15 minims (0.6 to 0.92 c.c.) of adrenalin should be given subcutaneously or intravenously if the dyspnea or collapse are marked. It may be necessary to resort to artificial respiration.

In severe cases of the disease, in an adult, 100 c.c. of the serum at one dose should be given every six or eight hours, in less severe cases every twelve or twenty-four hours, until there is a definite improvement, or until from four to six doses have been administered. The average case will not require more than three intravenous injections.

In the third stage, in the majority of cases, the intravenous treatment is combined with the intraspinal. In cases in which the disease has become localized in the meninges before a diagnosis could be made, intraspinal therapy alone may be sufficient. This is especially true of the less serious type of infection.

After describing the technic of spinal puncture, Herrick points out that this procedure has two objects: (1) drainage, (2) the introduction of the specific antiserum into the spinal canal, and its direct contact with the meninges. Given a case of well-marked meningitis, with a thick, purulent spinal fluid and marked systemic disturbance, the fluid is removed until the rate of flow becomes one drop every two or three seconds or until the patient complains of severe headache. If the fluid is clear it is not safe to remove more than 8 c.c. At no time should it be allowed to escape in a stream.

After the fluid has been withdrawn, about 30 c.c. of serum, warmed to the body temperature, are allowed to flow into the subdural space by gravity. It should never be injected by force. During the acute stage of the disease, if a large amount of cerebrospinal fluid is readily obtained by lumbar puncture, from 45 to 60 c.c. of serum may be injected. As a general rule from 5 to 10 c.c. less serum than the amount of fluid withdrawn should be injected. An average case requires about three or four doses, one every three hours; milder cases may improve after one or two treatments every twenty-four hours; severer cases may require ten or twelve.

Herrick considers that discontinuance of treatment is indicated: (1) when the temperature falls, with improvement of the general condition, (2) when the cerebrospinal fluid is less cloudy, free from organisms, and when leukocytes reappear in numbers.

If the intensive serum treatment outlined above is not followed by success it may be due to one or more of the following causes: (1) An overwhelming infection is present. (2) The serum does not contain antibodies specific for the particular strain of organism. (3) The organisms, being walled off, are inaccessible to the serum.

(4) Other complications than meningitis are present. Of these, according to the author, the second is the most common cause.

If intraspinal treatment gives rise to discomfort, pains in the back, legs or head and other evidences of hypersensitiveness of the meninges to the serum, it is best to discontinue drainage by lumbar puncture, unless the fluid is so cloudy and thick that block may result.

Serum sickness, characterized by fever, an urticarial or erythematous eruption, joint involvement, glandular swellings or edema, may appear from the seventh day after the beginning of the treatment. Although these symptoms do not contra-indicate further serum treatment, it is best to establish the absolute necessity for its continuance.

A complicating hydrocephalic meningitis, due to interference with the absorption of the cerebrospinal fluid by inflammation and subsequent thickening of the arachnoid villi, may occur early or late in the disease. It is more common in children than in adults. As a result of this "block," drainage is impaired. This is followed by an increased intracranial pressure, characterized by an increased clouding of consciousness, delirium, general muscular rigidity, tremor, emaciation, and a failure to obtain more than a few drops of thick cerebrospinal fluid by spinal puncture. Block may be prevented in some cases by repeated drainage by lumbar puncture at twelve-hour intervals, thus preventing stagnation of the fluid and the resulting adhesions. If block is diagnosed, puncture of the lateral ventricles through a trephine opening in adults, or through the anterior fontanel in infants, is to be done without delay. As much fluid as can readily be withdrawn is removed, and a somewhat smaller amount of serum injected. This procedure may be repeated every twenty-four hours. The author also mentions in this connection the usefulness of Cobb's method of relaxing the neck muscles under anesthesia and the manipulation of the head and neck with the needle in the spinal canal, in order to break up adhesions and to re-establish drainage. In some cases the same results have been obtained by puncture of the cisterna magna, and by other similar surgical procedures. To obtain the best results in "block," treatment must be instituted early and must be carried out energetically. All these methods must be reinforced by a high caloric diet and intravenous injections of normal salt solution or 20 per cent glucose.



Meningococcus arthritis is as a rule limited and without serious sequelæ. If swelling and pain are severe, the joint exudate may be aspirated and serum introduced. Meningococcic pericarditis with effusion has been treated successfully with aspiration and injection of 30 c.c. of serum. While meningococcic endocarditis seems to be a hopeless complication, Herrick thinks that large intravenous injections of serum may be tried.

In the local treatment of meningococcic panophthalmitis it is important to be careful not to injure the eye. If after the application of atropin and intravenous injections of the serum the condition is not favorably influenced, and if the patient is suffering from severe pain, it is advisable to enucleate the eye. Striking improvement generally follows in the patient's general condition. The author warns against resorting to this heroic procedure too early; at least several weeks should be allowed to elapse, after the beginning of the disease, as surgical procedures undertaken too early may be followed by a general dissemination of the infection.

The post-meningeal headaches, fatigue, vasomotor disturbances, photophobia, the paresis of the limbs, etc., etc., usually improve in time. Iodid of potash may be administered to aid absorption of the exudate. The poor mental condition in which these patients may be left after the acute symptoms of the disease have subsided, is best treated by psychotherapy. The cranial and peripheral nerve palsies which do not disappear in three months usually remain permanent.

M. KESCHNER.

CROOKSHANK, F. G.: A Note on the History of Epidemic Encephalomyelitis. *The Boston Medical and Surgical Journal*, January 8, 1920, clxxxii, No. 2, p. 34.

Clinical occurrences of what we now call encephalomyelitis or encephalomyelomeningitis have been recorded in modern times and for at least four hundred and fifty years. Generally these occurrences have been noted as incidental to major prevalences, known historically as sweating sicknesses, the epidemic catarrhs, influenzas, and the like. Special prevalences of these occurrences have usually appeared shortly before or immediately after major influenzal epidemics, or else in geographical proximity to endemic-epidemic influ-

enzal prevalences. Epidemic encephalomyelomeningitis represents an intensive and specialized reaction which has the same epidemiologic relation to pandemic influenza as have the prevalences and epidemics of "septic" pneumonia, of gastro-intestinal illness, and of other maladies described as occurring before and after the wide diffusions generally called pandemic influenza.

M. M. BANOWITCH.

GORDON, A.: Mental Disorders Following Influenza. *Archives of Internal Medicine*, December, 1919, xxiv, No. 6, 633.

Gordon analyzes a series of cases of mental disorders occurring in 66 patients during the asthenic stage of convalescence following influenza. Of the mental states observed in this series three varieties were differentiated: (*a*) a profound confusional psychosis with delusions and hallucinations; (*b*) a mild confusional state without hallucinations, but with illusional conceptions; and (*c*) cerebral asthenia with resulting amnesic phenomena. But few of the first group recovered, while most of the others regained their mental equilibrium with the improvement of the physical condition. The author attributes the symptoms to nutritional disturbances in the cerebral neurons, brought about by the altered composition of the body fluids. In the milder cases the changes are probably functional only, while in the severer cases there may be demonstrable organic changes in the cells, such as have been described by Ballet as occurring in the brains of patients who had been afflicted with Korsakoff's psychosis.

T. HOWARD.

HURLEY, J. R.: Influenza, with Especial Reference to the Pandemic of 1918. *Medical Record*, Oct. 18, 1919, xevi, 652.

From a review of the literature available on the subject, and from his experience as a passed assistant surgeon in the United States Public Health Service, the author concludes as follows:

(1) That the Pfeiffer bacillus plays more than a contributory rôle, if any, in the disease known as influenza has not been estab-

lished; and that it is the causative organism for the symptom-complex seen in influenza has been practically *disproven*.

(2) There is some evidence that the Pfeiffer bacillus may prepare the soil for the growth of certain streptococci and pneumococci, which seem to be the agents chiefly responsible for the fatalities; but further evidence and observation along this line are necessary.

(3) The evidence as to the presence of an infective filterable virus in influenza is inconclusive; rather the weight of the evidence on this subject at the present time is negative.

(4) There is favorable evidence that mixed bacterial vaccines, including streptococci and pneumococci isolated from fresh cases, are useful and worthy of trial in the prophylaxis of the disease.

(5) The early use of human immune blood serum from recent cases convalescing from influenza-pneumonia has given good results, and, where possible, warrants more extended trial and report in the future.

(6) The results derived from wearing gauze face masks, particularly those made of three-ply buttercloth, are such as to justify their use as a prophylactic measure not only by those in contact with the sick, but by all persons, mandatorily, during the presence of an influenza epidemic. The mask should not be depended upon as the sole protection, but as an adjuvant to all other prophylactic measures.

(7) The past history and present outlook regarding influenza constrains all health organizations to secure the proper plans, laws, regulations and appropriations requisite to render relief and to eradicate the disease.

M. KESCHNER.

SPOONER, L. H.: The Specific Diagnosis and Treatment of Acute Lobar Pneumonia. *Boston Medical and Surgical Journal*, Feb. 26, 1920, clxxxii, No. 9, p. 224.

The *Diplococcus pneumoniae* is the casual factor in acute lobar pneumonia in 85 per cent of the cases. This organism is divided into four distinct types depending upon the action of the sera of immunized animals upon varieties of the pneumococcus. The first three types are called fixed types, while type IV represents an organism which, according to specific serologic tests, does not fall into the



first three groups. Numerous methods of typing have been devised. Blake's method (white mouse) is the best. The diagnosis of the type can be made in twenty-four hours at the most.

The literature is reviewed, showing the percentage of the various types and the factors which modify them. *Conclusion*—Type I organism is found in 30 per cent of the cases of acute lobar pneumonia.

While good results have been reported from the use of polyvalent sera, its use is irrational and unjustifiable. Specific treatment by type I serum for type I pneumonia is distinctly indicated. The following routine was used by the author at Camp Devens Base Hospital. Every case of acute lobar pneumonia, as soon as a good specimen of sputum was submitted to the laboratory, received an intracutaneous injection of 0.02 c.c. horse serum diluted with 1:10 salt solution. As a control a similar injection of salt solution was used. An hour later, even when the test was negative, a desensitizing dose of from 0.5 to 1 c.c. of horse serum was injected subcutaneously. After this, as soon as the type was determined, the intravenous use of serum was begun. From 90 to 100 c.c., diluted with equal parts of sterile saline, were warmed to body temperature and injected by the gravity method into the median basilic vein.

The injection should consume at least from 20 to 30 minutes. Should cyanosis, pallor, or dyspnea appear, it is necessary to stop the injection. Treatment should be repeated every eight hours until improvement takes place.

Should the patient's reaction to the sensitization test be very pronounced, or should he give a history of asthma, one should proceed cautiously by the method devised by Cole: Give subcutaneously 0.025 c.c. of serum. Repeat, doubling the dose each time at half hour intervals, until 1 c.c. has been given. Then give 0.1 c.c. intravenously and repeat at half hour intervals until 25 c.c. have been given. Four hours later give 50 c.c., and then the regular dose in from six to eight hours. Should any anaphylactic phenomena appear, suspend the treatment for four hours and then resume at a dose lower than that which produced the reaction.

There is no relation between the reaction and the curative power of the serum. One hour later the signs of thermal reaction appear: chill, cyanosis, and elevation of temperature, followed by relaxation, sweating, and drop in temperature. In a few hours the temperature

again rises and further treatment is indicated. In some cases anaphylaxis may develop; 0.6 c.c. of 1:1000 adrenalin generally relieves the symptoms. Serum sickness generally follows from seven to ten days later.

Cases of type I, untreated with specific serum, have a mortality rate of between 25 and 32 per cent. Cole reports 107 cases treated with serum, showing 7.5 per cent mortality. In a special series studied at Camp Devens during the influenza epidemic the author observed a mortality rate of 43 per cent among those treated with a low grade (low titer) of commercial serum. In another series treated with high titer serum the mortality was reduced from 43 per cent to 7 per cent. Not only does specific serum reduce the mortality, but it also assures a limitation of the spread of the process. Unfortunately there is no corresponding decrease in the number of complications.

M. M. BANOWITCH.

MARK, L.: Comparative Prognosis of Tuberculous Lesions of Right and Left Lung. Report of 500 cases. *Journal of the American Medical Association*, May 10, 1919, lxxii, No. 19, pp. 1348-1351.

In the author's experience at Ohio State Sanatorium he has found that in cases with a greater amount of active involvement in the left lung there was slower progress toward quiescence than in cases in which the right lung was more involved. In the majority of cases of bilateral tuberculosis the right lung showed a tendency toward fibrosis, whereas the left lung was usually heavily infiltrated from the apex to the base, with thickening of the pleura and firm pleural adhesions, but little fibrosis. On the basis of statistics in 500 cases it was found that "in far-advanced cases of active pulmonary tuberculosis the percentage of left lung infections is greater than of the right lung, whereas it has been proved that the majority of early tuberculous cases present right lung infections." . . .

"In male cases there is a greater tendency toward arrestment or apparent arrestment than in the female, and in both male and female the right lung becomes arrested or apparently arrested far more often than does the left lung. The left lung cases show a greater tendency

toward quiescence, but the progress from this stage seems to be much slower than in the right." . . .

"The left-sided cases were more persistent in presenting a constant or an occasional afternoon increase of temperature. There was no apparent difference in the pulse-rate of either right-side or left-side cases. . . . The average gain in weight of the right-side cases was 12.8 pounds as compared with 14.8 pounds for left-side cases. . . . The patients who gained weight very rapidly showed a tendency to become tired and to have a rise in temperature with a very rapid pulse on the least exertion, and they had to be given absolute bed care for a longer period of time, in spite of their gain in weight and their apparent rapid improvement, than patients with the same amount of involvement in the right lung."

Of the far-advanced cases discharged as too sick for the hospital routine, the percentage of left-side cases was greater than of right. From this we may conclude that "in this type of case, when the left lung shows the greater amount of involvement the prognosis of building the person back to some working capacity or of bringing the chest to at least a point of quiescence is far less than of the right lung cases."

The author gives several reasons for the more rapid spread of the tuberculous focus in the left lung than in the right. "The left lung is considerably smaller than the right, and has but two lobes. The bronchus leading to the left lung forms a more obtuse angle, and is much smaller than the right bronchus. There are two fissures on the right and only one on the left. The interlobar clefts fence in the infection and prevent one lobe from being infected by the other, except through the regular channels along the bronchial tree. This fencing by the interlobar pleura is repeatedly seen on roentgenograms of the chest, and also in the sectioning of tuberculous lungs at necropsy."

In conclusion the author summarizes the results of his investigations as follows:

"(1) The amount of involvement being equal, the prognosis of lesions of the left lung is not as good as of the right lung.

"(2) Prognosis of the male cases is better than of the female cases.



“(3) There is less tendency toward fibrosis in the left as compared with the right lung.

“(4) Patients with active tuberculous lesions in the left lung require absolute bed care over a longer period of time than the right-side cases, to produce the same results.

“(5) Rapid gain in weight, especially of the left-side cases, does not always mean rapid progress toward quiescence.

“(6) Artificial pneumothorax of the left lung is more frequent than of the right.

“(7) The greater number of incipient cases show tuberculosis in the right lung, and the greater number of advanced cases in the left lung. The percentages of right and left lung cases are equal when all stages of the disease are considered.”

SOLOMON, H. C.: Result of Treatment of Neurosyphilis (General Paresis and Cerebrospinal Syphilis). Report of Patients' Condition Four Years or More after Leaving Hospital. *Boston Medical and Surgical Journal*, January 15, 1920, clxxxii, No. 3, p. 60.

The author published a series of 10 cases of neurosyphilis (8 diagnosed as general paralysis and 2 as cerebrospinal syphilis) in the Bulletin of the Massachusetts State Board of Insanity in 1916, to show the favorable results that may be obtained from treatment. In reply to requests for reports as to the outcome the author reconsiders the question four years later. One case has been lost sight of. Of the 8 diagnosed as general paralysis 5 are now living at home. Three are entirely well; 2 are not well but are able to care for themselves. Two are dead and 1 is in a hospital. Of the 2 who died 1 had a remission of eighteen months with complete economic efficiency, and all laboratory reactions negative. The 1 in the hospital had a remission of three years' duration. Of the 2 cases diagnosed as cerebrospinal lues (nonparetic), 1 left the hospital entirely normal, with negative laboratory reactions, and the other is serologically negative and mentally well after four years. The conclusions are that it is possible to help a proportion of these cases of general paresis or cerebrospinal lues with mental symptoms, and that intensive systematic treatment will change the prognosis of general paralysis. The

author also feels that the majority of cases of syphilis of the nervous system are entitled to intensive and systematic treatment, the form depending on the condition of each individual patient.

M. M. BANOWITCH.

CASTELLANI, A.: The Etiology of Thrush. *Journal of Tropical Medicine and Hygiene*, 1920, **xxiii**, 17.

Castellani states that the etiology of thrush is not as simple as is generally conceded, but that instead of being due to a single fungus, *Oidium albicans*, it is due to a number of different fungi, some of which even belong to different families. He distinguishes clinically two types of thrush: (1) the white or grey type; (2) the yellow type, which is of rare occurrence. Each clinical type has associated with it its specific fungi.

F. HULTON-FRANKEL.

LONGCORE, W. T.: Cerebral and Spinal Manifestations of Purpura Hemorrhagica. *The Medical Clinics of North America*, Sept., 1919, **iii**, No. 2, p. 279.

The course and symptoms of several cases are described, among them one which was probably an instance of aplastic anemia with purpura as a complicating factor. The usual manifestations of purpura were observed with those of a cerebrospinal nature. Two of the cases developed symptoms of meningeal involvement, such as rigidity of the neck, Kernig sign, unequal pupils, spasticity of group muscles, and ptosis of one lid. Lumbar puncture, which is advised as a therapeutic measure for relief of pressure, showed in one a clear fluid under pressure with 200 cells per cu.mm. and globulin +; in the other the fluid was thick and bloody. The remaining cases were followed to autopsy. One, which ran a rapid course, developed coma, quickly followed by death, due to multiple larger hemorrhages in the cerebrum. In two cases death occurred, with diffuse hemorrhages into the subarachnoid space combined with great numbers of smaller hemorrhages into the cortex of the cerebrum and cerebellum. The presence of the cerebral hemorrhage in one case was not suspected; in

the other, examination revealed coma, strabismus, exaggerated reflexes, double ankle clonus, and bilateral Babinski reflex.

In reviewing the subject it is stated that hemorrhages of varying extent may occur beneath the dura, in the meninges, or in the substance of the brain. The hemorrhages are usually multiple, and the resultant symptoms are dependent upon the location and extent. Hemiplegia, group muscle paraplegias, coma, convulsions, and signs of meningeal involvement are the usual symptoms. From the cases showing meningeal manifestations it is concluded that a hemorrhage into the spinal or cerebral meninges may occur and the patient recover. In the case showing a clear spinal fluid the suggestion is made that small hemorrhages in the cortex of the brain or cerebellum might account for the meningeal symptoms and slight focal and generalized signs.

H. WOLFER.

OCHSNER, A. J.: Practical Principles for Protection Against Cancer. *Illinois Medical Journal*, November, 1919, xxxvi, 225.

Judging from a study of statistics and reports of scientific studies, and from personal observations, the following conclusions as to protection against cancer seem, in Ochsner's opinion, to be warranted:

(1) The medical profession and the public in general must be taught to appreciate the fact that cancer is primarily a local condition.

(2) Unless recognized and removed early cancer is usually fatal.

(3) A careful examination should invariably be made as soon as cancer is suspected.

(4) If the physician is uncertain about the diagnosis, the opinion of a consultant with more extensive experience should be sought at once.

(5) During the cancer age, which is, generally speaking, over forty years, in case of doubt the new growth should be removed immediately and thoroughly.

(6) Inoperable cancer should be removed only when the patient's friends distinctly understand that the operation is palliative and only for the purpose of minimizing the patient's suffering.



(7) Violent manipulation for purposes of diagnosis and treatment must be avoided.

(8) All sources of chronic irritation of the tissues must be eliminated.

(9) Cleanliness of the skin must be taught and practiced.

(10) All articles of food which have come in contact with manure or human excreta in the form of fertilizer must be boiled before eating.

(11) Sewage must be disposed of so as not to contaminate food or water to be utilized for human consumption.

M. KESCHNER.

DUBARRY, E.: Clinical Considerations on the Influence of (Paludism) Malaria on Labor and the Puerperium, Based on Forty-two Cases. *International Clinics*, 29th Series, 1919, iii, 199.

As a result of the study of the literature on this subject and of personal experience and records of the cases at the Maternity of the Civil Hospital of Tunis, Dubarry offers the following conclusions:

(1) The duration of labor is notably increased when malarial cachexia is present.

(2) Malaria appears to create a predisposition to hemorrhage at the time of delivery.

(3) Paludism rarely causes miscarriages, but cases of premature labor from this cause are somewhat more frequent.

(4) The weight of the infants of malarial women is only lowered when the mother has malarial cachexia; otherwise the weight is normal.

(5) Paludism creates a favorable soil for the development of all types of infection, consequently in malarial women care should be taken to avoid uterine infection. Uterine involution is particularly apt to take place in malarial patients, and the lochia are more bloody than is the case in other women. In cases of subinvolution a state of attenuated infection may be suspected, to which the subject is exposed because of the preëxisting affection.

(6) The treatment of the accidents of postpartum paludism is the same as that of paludism, namely, the administration of quinin. It is advisable to give the drug as a prophylactic measure and thus avoid postpartum paroxysms.

M. KESCHNER.

FENLON, R. L.: Diet Reduction with Retention of Protein to Relieve Glycosuria in Diabetes Mellitus. *The Boston Medical and Surgical Journal*, Feb. 12, 1920, clxxxii, No. 7, p. 168.

The theories underlying the diet reduction method are as follows:

(1) By keeping the protein intake of the diet at a necessary level, the tendency toward the development of acidosis is decreased, as the patient does not have to burn his own body fats.

(2) Protein is needed to replace that lost by the wear and tear on the tissues during the metabolic changes of the body. The Chittenden standard is 0.12 grams of nitrogen per kilogram of body weight. We conclude that this amount of protein is necessary to the body during a diet reduction. This would average from 40 to 50 grams daily. This amount of protein is increased in this method because of the altered metabolic changes in diabetes.

(3) With the protein intake maintained at a definite level the percentage of carbohydrate in the diet would be relatively decreased. Under treatment preparatory to fasting the protein and fat are both reduced, leaving the carbohydrates relatively high. By keeping the percentage of sugar in the food intake low the system might be more quickly drained of the excess sugar present in the blood stream.

(4) The tolerance of the patient is more quickly and easily determined.

(5) There is less complaint of hunger on the part of the patient when this method of reducing the diet is used.

(6) The protein in the diet, by maintaining the serum protein in the blood, possibly aids in the nutrition and functioning of the kidney during the diet reduction.

*The Method of Diet Reduction.*—First, eliminate fats for one or two days, at the same time maintaining the proteins and carbohydrates each at from 60 to 100 grams. Second, leaving the proteins

as before, halve the carbohydrates each day until the glycosuria is relieved. If the glycosuria persists when 10 grams of carbohydrate are reached continue at 10 grams for three days, unless the sugar disappears before that time. If glycosuria is still present at the end of three days add from 50 to 100 grams of oatmeal to the diet for two days. Then, if the glycosuria persists, repeat the diet used just preceding the oatmeal days, lowering the proteins one-third. Keep the patient two days on this diet if necessary. If there is still glycosuria, starve the patient, giving only fat-free broths and water for a two-day period. If necessary revert to the oatmeal diet for two days and again starve.

When building up the diet, if starvation has been used, build up the protein first to 50 or 60 grams. Then gradually increase the carbohydrates to the danger point. Lastly, add fats, from 5 to 10 grams a day in severe cases and 25 grams a day in mild cases. If starvation has not been used, the protein is already in the diet. In this case increase the carbohydrates from 5 to 10 grams daily to the danger point. Then, in the severe cases, add 5 grams every second or third day. In mild cases increase from 10 to 15 or more grams daily. When the carbohydrates reach 50, if a break has not occurred before, increase the fats as stated above.

This method was tried out in 15 cases. All were discharged from the hospital free from sugar and ketone. The points of interest in these cases, to be confirmed in future, are:

(1) Avoid discharging a patient with a fat content in the diet over 15 grams higher than the next highest constituent of the diet.

(2) Try to avoid the appearance of sugar in the urine after the patient becomes sugar-free. Breaks of this kind sensitize the system to sugar and decrease the final carbohydrate tolerance.

(3) Discharge the patient following the first course of hospital treatment with a diet just sufficient to meet the caloric requirements. Do not attempt to push the diet to the limit. By taking into consideration the specific gravity of the urine and the concentration of the twenty-four-hour specimen, an approaching glycosuria may be detected.

(4) Blood-sugar readings are relatively higher with advancing years.

M. M. BANOWITCH.



HAAAS, S.: The Atropin Treatment of Pylorospasm and Pyloric Stenosis. *Archives of Pediatrics*, Oct., 1919, xxxvi, No. 9.

The author takes issue with the claim made by most of the authorities of the present time, that hypertrophic pyloric stenosis and pylorospasm are distinct entities. The existence of a hard cartilaginous mass in the pylorus in cases of stenosis and the persistence of this mass long after a cure has been effected by operation or medical treatment, is overbalanced by the following observations:

(a) All cases of pylorospasm observed by the author during the last four years, including 4 in which operation was advised, responded to atropin. This included a case of complete stenosis.

(b) It was found, at autopsy, that the mass was absent and the pylorus patulous seven and one-half months after a Rammstedt operation on a two weeks old infant with a definite hard mass.

(c) As demonstrated by Rachford, if the sphincter is so cut as to leave the orifice patulous and prevent muscular spasm of these fibers, the tumor disappears.

(d) Strauss showed in his dissection of 65 tumors at operation that the mass was proportionate in size to the age of the infant, and therefore developed progressively.

(e) There is no disarrangement of the histologic elements of the tumor.

(f) In fatigue, according to Rogers, the inhibitory impulses of the sympathetic system fail, and the vagus, then overactive, causes hypersecretion, hyperacidity and pylorospasm.

The author recognizes a clinical entity, which he terms the "hypertonic infant," in whom there is hypertonicity of the skeletal muscles as well as hyperactivity of the smooth muscles of the hollow viscera, producing spasm of the latter. This condition is accounted for by a disturbance of the vegetative nervous system. This system, made up of two parts, the autonomic and the sympathetic, and normally in balance, is now out of balance, with an overaction of the autonomic system, or vagotonia. He believes that true organic hypertrophic stenosis is an exceedingly rare condition, and basing his opinion on the foregoing hypothesis, he strongly advocates the thorough trial of atropin before resorting to radical procedures.

The drug must be of known pharmaceutical value and should be

given in sufficient dosage to be effective. A hypertonic infant from a few weeks to a few months of age can tolerate from  $1/50$  to  $1/25$  of a grain (0.0013 to 0.0025 gram) every twenty-four hours. The procedure is as follows: Prepare a solution of atropin, 1-1000. Start on one drop of this solution in the bottle, or, if the infant is breast-fed, in a teaspoonful of water preceding a feeding. At the next feeding give 2 drops, and continue until the symptoms improve, unless toxic reaction is noticed. The latter is shown by flushing of the face and body, mydriasis, slight rise of temperature, dryness of the lips and mouth, inability to secrete tears, irritability, pallor. It may be necessary to stop the drug for a few doses. The drug should be given until it can be demonstrated by lowering the quantity, or by omission, that it is no longer necessary.

T. B. GIVAN.

ERVIN, D. M.: Relation of the Pancreas to the Diabetic State. *Journal of Laboratory and Clinical Medicine*, Sept., 1919, iv, No. 12, p. 711.

By a series of experiments on dogs and rabbits the author showed that the external secretion of the pancreas, passing out through the duct, is a hydrolyzing enzyme, which changes the starch into glucose, while the internal secretion of the pancreas, from the islands of Langerhans, is diverted into the portal blood to act as a synthetic enzyme, which converts the glucose into glycogen, in which state it is stored in the body. It is also shown that in animals from which the pancreas has been removed there is no interference with the normal rate of oxidation of glucose.

One set of experiments was performed to test the glucose consumption in the diabetic animal, that condition being produced by the removal of the pancreas. Results showed that the normal glucose consumption of the leg of a dog, determined by testing the blood-sugar from the femoral artery and femoral vein before the removal of the pancreas, was 0.036 per cent, and that the glucose consumption after removal of the pancreas, tested in the same way, was 0.035 per cent. In this and other experiments a hyperglycemia and glycosuria were produced by removal of the pancreas, while the oxidation remained normal. Another set of experiments, on rabbits, shows that if a glucose solution is introduced into the ileum,

and the blood sugar is ascertained, the blood sugar will not rise appreciably unless the pancreas is removed, which causes a marked hyperglycemia and glycosuria.

*Summary.*—Experiments show that a depancreatized animal, as long as six hours after depancreatization, develops a hyperglycemia and glycosuria, just as in the true state of pancreatic diabetes, yet consumes glucose at the same rate as the normal animal. The hyperglycemia and glycosuria are dependent upon the rate of synthesis of glucose into glycogen, and not upon interference with the normal rate of oxidation. The internal secretion of the pancreas is an enzyme, similar to the external, but diverted into the portal blood for the rapid synthesis of glucose into glycogen. The failure of its action is the cause of pancreatic diabetes. A diabetic is one who fails to synthesize the absorbed glucose into glycogen at a sufficiently rapid rate to prevent a hyperglycemia.

C. M. ANDERSON.

BUERGER, L.: Cystitis. *The Medical Clinics of North America*, Sept., 1919, iii, No. 2, p. 301.

The term cystitis is employed to include the many lesions giving rise to the symptom-complex indicative of bladder disorder. Emphasis is laid upon the great variety of pathological lesions to be found in the bladder, and the numerous extra- and intravesicular conditions giving rise to the symptoms of "cystitis." One should, therefore, always determine whether the bladder involvement is primary or secondary. The importance of a thorough cystoscopic examination in all cases is illustrated by case reports. Thus a case thought to be cystitis was found to be pyelitis with no signs or symptoms referable to the kidney. A correct clinical diagnosis may often be made with success, depending upon the care observed in taking a detailed history of the disorder, and in making a thorough physical examination. Medicinal treatment is of most value in cases of short duration and of bacterial origin. The chronic cases of cystitis are usually found to be associated with some marked pathological changes in the bladder or related extravesicular maladies. Treatment, to be of permanent value, must be left to those skilled in the special surgical technic.

H. WOLFER.



BRAM, I.: The Rational Therapeusis of Exophthalmic Goiter. *Endocrinology*, Oct.-Dec., 1919, iii, No. 4, Serial No. 12, p. 467.

This is an argumentative essay in which the author emphasizes the necessity for the exhibition of less haste by the surgeon and more patience by the internist with respect to the nature of the treatment to be employed in the management of exophthalmic goiter. An analogy is drawn between surgery of the tonsils and surgical procedures as employed in Graves' disease, in which it is shown that in the former instance surgery is permissible; in the latter the internist alone can produce permanent results. "Remove all of a diseased tonsil and your tonsillectomy is complete and satisfactory. . . . The patient is better off in its absence. Leave a part of said tonsil and we are often in the course of time confronted with the need for another operation, the remaining portion having served as a root for the regeneration of the removed tissue. Remove the thyroid, however, and you ruin or kill your patient. . . . Leave a portion of the diseased thyroid in order to conserve the life of the patient, and like the lingering portion of a diseased tonsil, not only will it continue poisoning the body with or without a period of apparent improvement or even apparent cure, but sooner or later the entire gland is regenerated, and we have again a full fledged case of exophthalmic goiter." Bram not only cites well known internists whose views on this subject coincide with his own, but he also quotes from the writings of surgeons who specialize in thyroid work, pointing out their attitude of indecision in their very enthusiasm concerning the virtues of surgical interference in this disease. The mortality rate in operations on subjects of Graves' disease is really higher than the figures presented by the statistics, for many cases operated upon are not instances of true hyperthyroidism. Again, in cases of true Graves' disease, the term "cure" as employed by the surgeon, usually denotes *operative cure* or *temporary improvement* of a percentage of cases, rarely, if ever, *permanent recovery*. The author emphasizes the inconsistency of surgical interference in this affection, by pointing out that such purely local interference as a thyroidectomy cannot be expected to overcome a condition like Graves' disease, which is of admittedly widespread etiology, pathology, and clinical manifestations. To attack the thyroid gland, then, would mean an interfer-

ence with but one link in the chain of events constituting the syndrome of this disease. On the other hand, non-surgical treatment offers no complications, no mutilating scars, and no mortality if the case presents itself before the vital organs are badly damaged. Bram has found that, barring such surgical indications as dangerous pressure symptoms and malignant changes within the gland, the internist experienced in endocrinology is capable of curing nearly every case of exophthalmic goiter brought to his attention. This is accomplished by means of dietetic, hygienic, medicinal, psychotherapeutic, electrotherapeutic and other measures properly employed for the required length of time. At least a fair degree of coöperation on the part of the patient, and strict individualization by the physician, must dominate the treatment.

S. E. JELLIFFE.

McCASKEY, G. W.: The Differential Diagnosis of Hyperthyroidism by Basal Metabolism and Alimentary Hyperglycemia. *New York Medical Journal*, Oct. 11, 1919, ex, No. 15, p. 607.

Utilizing the conclusions reached by Kendall and Plummer of the Mayo Clinic, in regard to the effect of certain quantities of thyrotoxin upon the tissue changes of the body, McCaskey bases his article on the following assumptions:

(1) The symptoms of hyperthyroidism and hypothyroidism are due to quantitative variations of thyrotoxin in the body cells.

(2) The fundamental phenomenon which dominates the entire clinical picture from cretinism to "Basedowism" is a perversion of the metabolic rate.

(3) This metabolic rate has its absolute equivalent, in accordance with fully established physical laws, in the heat-production of the entire mass of body cells.

(4) This heat-production is essentially a process of oxidation and is equivalent to the quantity of oxygen consumed, the latter being regulated by, and dependent upon, the metabolic rate.

(5) It is now possible, with the comparatively simple Benedict portable respiration apparatus, to determine clinically the oxygen

consumption over a sufficient period of time, say from ten to fifteen minutes, with sufficient accuracy for all clinical purposes.

(6) If food metabolism is eliminated by from twelve to fifteen hours' starvation (the usual normal condition in the morning), and the metabolism of voluntary muscular effort is eliminated by absolute rest in the recumbent position (from one-half to one hour is sufficient time), there remain only the energy output—the heat-production—the metabolism of the circulatory and respiratory mechanism, with small and probably negligible additions for the phenomena of secretion, and the intracellular chemical changes of the cells of the body while at rest, which is called basal metabolism. This so-called metabolism is very constant, not only in the same individual but in all individuals, when calculated *in proportion to the area of body surface*, probably varying in health, in a large majority of people, less than 10 per cent from the average normal rate.

The clinical estimation of basal metabolism is thus a practical and reliable index of the functional activity of the thyroid gland in health and disease. Before a final decision as to the functional state of the thyroid is made, certain important limitations and reservations must be taken into consideration. In other words, what other conditions, aside from perverted thyroid activity, may produce fluctuations of the basal metabolism? In reality such factors do exist, but they are of such a nature that careful clinical study will easily differentiate them.

Probably the most important of these factors is fever, the very essence of which, whatever its cause, is an increased metabolic rate. Pyrexial states from other causes must, therefore, be excluded, or their probable relative value determined, before an increased basal metabolism is attributed entirely to hyperthyroidism. In this connection it is well to bear in mind that in the severer grades of hyperthyroidism slight fever is quite common. Chronic infections such as tuberculosis and syphilis sometimes play a confusing rôle and prove the absolute necessity of a thorough clinical study of all cases.

Severe disease of the heart and kidneys is another condition which requires careful attention. In patients with dyspnea due to cardiac decompensation there is apparently a definite rise in the basal metabolism, while in edematous patients the metabolic rate is lowered.



In pernicious anemia, especially in its severe stages, there is a considerable increase in the basal metabolism, which is even higher in leukemia.

An interesting and rather important fact to remember is that a cup of coffee in the morning, before the metabolism observation is made, produces an increase of from 7 to 23 per cent in the basal metabolism.

A very important factor is the age of the patient. The average rate of 36.9 calories for women and 39.7 for men (by the "height-weight" formula) applies to the ages of from twenty to fifty, which includes most of the cases of thyroid disease. Above forty years, the rate begins to fall slightly.

Perhaps the most difficult problem is the clinical interpretation of the metabolic rate in borderline cases, in which the variations are necessarily small. These are naturally the cases in which diagnostic aid is most needed. It is generally agreed that the normal rate may vary from 10 per cent above to 10 per cent below the average normal. This does not mean that in a normal individual this wide range of deviation ordinarily occurs, but that in a large group of apparently normal individuals deviations as great as these may be found. This would seem to suggest that each individual may have a "norm," just as Wunderlich proved long ago was true of temperature. Gephart and Dubois insist that the metabolism is not to be considered abnormal unless it varies from the normal by at least 15 per cent, although it is probably abnormal above 10 per cent.

The relation between hyperthyroidism and alimentary hyperglycemia is summarized by McCaskey as follows:

(1) Alimentary hyperglycemia following the ingestion of 100 grams of glucose is present in probably every case of thyrotoxicosis.

(2) It is rarely, if ever, present at the end of the first hour in normal individuals, although it may have occurred at the end of about thirty minutes.

(3) Its presence, therefore, in one hour, and especially in two hours, always indicates abnormal carbohydrate metabolism, unless gastro-intestinal function is delayed.

(4) It occurs in latent, and of course in manifest, diabetes, in alcoholism, malignant disease, arthritis, and probably in a considerable number of infections, acute, or chronic, allied to arthritis.

(5) Before attaching positive diagnostic value to alimentary hyperglycemia in suspected hyperthyroidism, these conditions and possibly others of which we are now learning must be excluded.

(6) While its positive value only may be considered corroborative, its negative value in excluding hyperthyroidism is very great, and probably exceeds 90 per cent.

(7) In hyperthyroidism there is no constant direct ratio between its intensity and the height of the alimentary hyperglycemia, although in general the blood-sugar values in severe cases are high.

(8) Too much importance should not be attached to alimentary blood-sugar values below 140 mg. of sugar in 100 c.c. of blood, although sharp lines of demarcation cannot yet be drawn.

M. KESCHNER.

MOSENTHAL, H. O.: The Symptoms and Treatment of Retention of Waste Products in Nephritis. *The Medical Clinics of North America*, Sept., 1919, iii, No. 2, p. 353.

A case is described in which albuminuria has persisted for a period of six years and in which for the past five months there has been a moderate edema of the lower extremities. Mosenthal discusses the subject of albuminuria with no symptoms of retention products and negative cardiovascular and renal function findings. The albuminuria may, under these circumstances, be ignored, for in some patients it cannot be controlled by any means at our command. Under proper observation a fairly liberal diet may be allowed. Epstein recommends a rather high protein diet, believing that the nutrition of the patient is hereby improved. Mosenthal believes that a full diet is the best means of rectifying an anemia, and that without it iron is almost useless, especially in nephritis.

Hypertension cases showing good kidney function tests, which are negative for retention products, should also be maintained on full nutrition, and for this protein in the form of meat is invaluable.

As a guide to proper treatment the renal function tests are essential. Nocturnal polyuria and fixation of the specific gravity of the urine (below 1.020), even with the other tests within normal limits, should be taken to indicate early impaired renal function, and the case should be closely watched. The Ambard constant and the

McLean index give us an accurate means of determining the degree of renal function present, and the progress of the renal process, even though the blood urea is low as a result of the dietetic therapy.

Edema calls for a salt-free diet. According to Epstein the lack of protein in the blood causes a diminished osmotic pressure, allowing the fluids to pass into the tissues. On this basis he gives the patients showing edema a high protein diet (80 to 200 grams) which is followed by good results. This is not advisable in the cases showing retention of nitrogenous products. Mosenthal thinks it best to avoid the use of diuretics in edema unless the latter is due to a cardiac factor, and then digitalis acts well. The use of hot packs is apt to be debilitating to the patient.

In the management of uremia the use of glucose in 5 to 10 per cent solution is recommended, given either intravenously or by rectum. To an unconscious patient it may be given by the stomach tube. The administration of plenty of fluid (orangeade, lemonade, water in amounts of from 2,500 to 2,000 c.c. in 24 hours) is advised. Cardiac embarrassment should be avoided, but the presence of edema is no contra-indication to forcing fluids. Phlebotomy should be employed with great care and only in selected cases. Transfusion may at times be of value, especially if given after a phlebotomy.

For the acidosis occurring in nephritis bicarbonate of soda may be employed, the amount to be used being dependent on the  $\text{CO}_2$  tension of the alveolar air.

Marriott and Howland advise the administration of calcium as an aid in eliminating the phosphates.

H. WOLFER.

GIFFIN, H. Z.: Persistent Eosinophilia, with Hyperleukocytosis and Splenomegaly. *American Journal of Medical Sciences*, Nov., 1919, clviii, No. 5, p. 618.

The case is given of a male thirty-one years old, with generalized anasarca and moderate anemia. There was a past history of fever simulating typhoid, followed by pneumonia eight years ago; the patient had never been well since. Gradually, over a period of eighteen months, he became dyspneic, coughed, occasionally vomited.



Later, he developed pain in the left thoracic region, and edema of the legs and face. All symptoms became rapidly worse five weeks before he presented himself for examination. At this time he could not work on account of breathlessness, wheezing, and cough. On examination he showed marked edema of the legs, serotum, and body up to the level of the arm-pits. The axillary glands were easily palpated. Marked splenomegaly was observed, extending to the navel. A Wassermann test was negative. There was no indication of nephritis. The stools were negative. Microscopic examination of lymph-glands and skeletal muscles was negative. Leukocytosis was 21,800, with an eosinophilia of 73.6 per cent. The total lymphocytes formed 19.3 per cent, while the polymorphonuclear count was only 13 per cent. The red-cell count was 3,620,000, with 69 per cent hemoglobin. At first the patient was given absolute rest and milk diet for two months. In ten days the edema subsided. He did light work for about fourteen months, and returned for examination in fairly good condition. Owing to the marked splenomegaly and persistent blood picture his spleen was removed. It measured 10 by 12 inches and weighed 2,110 grams. The macroscopic picture was of myelogenous leukemia. The left lobe of the liver was enlarged. Within one month after splenectomy the leukocytes increased to 97,200, with 79 per cent eosinophils. The patient was in good general condition. Three and a half years later his leukocytes numbered 135,000, 87 per cent eosinophils. He continued in good health for another year, when gradually weakness, cough and dyspnea returned. Death was due to empyema following pneumonia. At autopsy enormous numbers of eosinophilic polymorphonuclears were found in all hemopoietic organs. Eosinophilic myelocytes were numerous in the bone-marrow and lymph-glands. The author regards this case as an instance of eosinophilic hyperleukocytosis, the blood-picture of which was remarkably altered by removal of the spleen. The permanent increase of leukocytes following splenectomy indicates a special function of the spleen with respect to eosinophilic cells or with respect to the toxins which eosinophilic cells are capable of absorbing.

A. T. MAYS.

FRAUENTHAL, H. W.: Rheumatism in the Light of Modern Research. *New York Medical Journal*, Dec. 20, 1919, cx, No. 25, p. 1,024.

Until about ten years ago, Frauenthal points out, various kinds of pains were considered to be due to rheumatism, the underlying cause being thought to be the uric acid in the system. The conditions which were previously regarded as rheumatic may now be divided into two classes, about 70 per cent of them being due to various types of focal infection and about 30 per cent to disturbances of metabolism, *i. e.*, excessive food; too much of one kind of food, inability to digest certain kinds of food, etc.

Any of the following infective or septic processes affecting the system may produce an acute or chronic inflammation of the joints:

(1) Local suppuration in the mouth and nose, carious teeth, diseased gums and tonsils; disease of the accessory sinuses, and middle ear affections.

(2) Acute or chronic infection of the genito-urinary tract.

(3) Puerperal sepsis.

(4) Any form of infection and disease of the gastro-intestinal tract.

(5) Sepsis in the bronchial and pulmonary system.

(6) Infection by any specific bacterium which has proved a source of arthritis: streptococcus, staphylococcus, pneumococcus, gonococcus, typhoid. *Streptococcus erysipelatis*, meningococcus, the bacilli of dysentery, etc.

(7) The exanthemata and infectious diseases common to childhood.

(8) Acute rheumatism, which is one of the best examples of acute synovitis. It is also associated with suppurative processes in the joints, as is naturally to be expected in an affection which so often leads to malignant endocarditis and septicopyemia.

(9) The chronic granulomata, syphilis and tuberculosis.

(10) Many tropical diseases.

(11) Any lesion, however small or unexpected, which may lead to septicopyemia, whether acute or chronic, has the capacity to infect a joint.

A bacterial process may produce arthritis in two ways:

(1) By septicemia or pyemia, *i. e.*, the microorganisms themselves gain admission to the joint-tissue and thus excite active disease of the joint.

(2) As a result of the production of toxins in any local focus of disease (*i. e.*, not in the joint itself) and of their circulation in the blood current, there is a tendency to the production of disease in any of the tissues of the body. If the vitality of any part has been undermined by over-use, injury, or exposure to cold, these toxins are most apt to excite inflammation in that part, and if that part is a joint, the result is a synovitis or arthritis. The author believes that whenever a "cold" is considered to be the cause of synovitis or arthritis, it must be remembered that in all probability the "cold" is only a contributory cause, and that the real cause must be sought in some septic focus in another part of the body.

Frauenthal is still unconvinced that errors of metabolism, *per se*, unaccompanied by bacterial disorders of a septic nature in the gastro-intestinal tract, are ever a cause of arthritis. In cases of toxic arthritis he also suspects some microorganism to be the exciting factor. The importance of focal infections as a cause of joint disease is not sufficiently appreciated at the present day, but the author feels "sure that the teeth and gums as sources of infection are overestimated and (that) much harm is done by the promiscuous extraction of teeth owing to incompetent interpretations of x-rays."

The relation of pyorrhea to arthritis is described by the author as an infection occurring *around* the roots of the teeth or *at* the roots of the teeth where, after an invasion of streptococci, staphylococci or other pathogenic microorganisms, an inflammatory process is set up, from which the bacteria are carried by the blood stream and lymphatics through the system, finally producing an acute inflammatory process in one or more joints.

In Frauenthal's opinion, the so-called rheumatic conditions in children are most commonly due to the streptococcus or to other bacteria in the tonsils, adenoids and mucous lining of the nose and throat; at times the original infection is of so mild a character as to be overlooked. He also adds that it is surprising how frequently infected hemorrhoids, fistulas and abscesses of the rectum are foci from which infected joint conditions develop. He calls attention to a class of cases in which acute inflammation of the feet and an



inflammatory condition in the larger joints are present in married women between twenty and forty years of age. The patients give negative Wassermann and gonorrheal fixation tests; a vaginal discharge is present, and often a laceration of the cervix uteri, which causes lymphatic absorption. Repeated smears for gonococci are negative. The feet are swollen, tender and painful. The patient has difficulty in walking; often the large joints are involved. These joint infections are said to be cured by douches of a solution of iodine and bichlorid of mercury.

Statistics show that from 60 to 80 per cent of the male population of cities acquire gonorrhea and that of these from 2 to 7 per cent have gonorrheal rheumatism. Kimball reports that out of 600 children admitted to the Babies' Hospital in one year, 70 had gonorrhea; in 10 arthritis developed. During the treatment of these cases the local infection must be eliminated before the arthritis can be expected to subside. In gonorrhea as well as in streptococcal infections, there is great danger of involvement of the heart.

Before the routine Wassermann test was in vogue, the frequency of luetic arthritis was overlooked, most of the cases being regarded as tuberculous. During the past fifteen years, Frauenthal found that more than 15 per cent of the cases of arthritis at the Hospital for Deformities and Joint Diseases (New York City) were due to syphilis. An incorrect diagnosis of these cases to-day he ascribes to faulty interpretations of the roentgenological findings and to failure to avail oneself of all the modern methods of diagnosis, particularly of the Wassermann reaction.

The author concludes the paper with a chapter on treatment, in which he urges the necessity of eliminating the spreading foci of the disease in all cases of local infection. Local treatment of the joint must be given for the relief of pain, the prevention of joint deformity, and the restoration of function of the joint to normal. He advises the employment of salicylates, aspirin, novaspirin, acetates and citrates. Autogenous and mixed vaccines are not to be given during the acute manifestations of the disease. In chronic arthritis, he has obtained remarkable results with nonspecific protein antigens. These may sometimes give violent reactions (a temperature of 105° F., or 40.55° C.), but they need not be a source of apprehension.

The wonderful results obtained in the army during the war

from the use of physical therapeutics has awakened the interest of physicians in these measures. Some of these are:

- (1). Massage.
- (2). Mechanical vibration with a regular stroke, which is more efficient in giving deep massage than the hand.
- (3). Baking by dry heat in a temperature of from 150° to 400° F. (65.55° to 186.66° C.), to produce congestion and promote elimination.
- (4). Hydrotherapeutics—general baths in which the trunk and extremities are immersed, aerated baths, brine baths, sedative pool baths, whirlpool baths, contrast baths, hot and cold packs, douches and showers, low pressure douches, needle baths, and showers.
- (5). Electric light treatment as a substitute for the actinic rays of the sun.
- (6). The galvanic, faradic, sinusoidal and Morton wave current, to stimulate the circulation and promote the absorption of exudates.
- (7). Diathermia, for its action on metabolism.
- (8). Electro-ionization with the lithium compounds, iodine, colchicum, Echinacea or the salicylates.

M. KESCHNER.

HOWLAND, J. B.: How to Insure a Safe Milk Supply in the Hospital. *The Modern Hospital*, Oct., 1919, xiii, No. 4, 258.

It is the duty of every hospital superintendent to see that only safe milk is distributed for drinking purposes to all under his charge. Epidemics traced definitely to the milk supply in Boston during a five-year period are listed by Dr. M. F. Rosenau as follows:

1907	Diphtheria	72 cases
1907	Scarlet fever	717 cases
1908	Typhoid fever	400 cases
1910	Scarlet fever	842 cases
1911	Septic sore throat	2,064 cases
Total		4,095 cases

The results of illness due to infected milk may be at least those of economic loss, if not death. Patients may be detained longer in the hospital because of sore throat, pupil nurses lose time which must be made up before graduation, illness of employees may cripple hospital departments, or the house staff may be patients instead of part of the working force.

Pasteurized milk for use among adults and older children is generally conceded to be suitable. The process of heating the milk to from 145° to 150° F. (62.78° to 65.55° C.) for thirty minutes will kill many pathogenic organisms, including those of tuberculosis, typhoid fever and diphtheria. The ideal method is one in which the milk, after pasteurization, is sealed at once in small units without human contact. For the smaller hospitals the delivery of pasteurized milk in bottles is the best solution of the problem. This method is too expensive, however, for the larger users.

We shall assume that the milk is purchased from a reliable source and, after pasteurization (which has eliminated infection from the cows and the milkers), is delivered in large sealed cans at the hospital. Here it should be handled by as few people as possible (preferably one) and the milk-handlers should not be a source of infection. The serving of the milk from the kitchen to the wards by any one who can be spared at the particular time is a bad plan. One may run considerable risk of infecting the milk and have little or no knowledge of the source of infection.

The milk should go at once to a milk room, where one trained person is responsible for it until it is put into small cans or bottles for distribution. A satisfactory milk room may be constructed and equipped without great expense. The room, if of brick, painted a light color, can easily be kept clean by hosing it down with water. The floor may be of cement or asphalt, graded to a drain. If there is another story underneath, waterproofing must, of course, be used in laying the floors. The equipment suggested is as follows: a receiving and mixing tank of copper, tinned or agate-lined. This should have a sloping bottom with an easily cleaned draw-off cock which serves as a means of filling bottles and cans, and as a drain for cleaning. If the milk is to be bottled, a tank equipped with automatic bottle fillers may be purchased. The author would recommend straining the milk as it is poured into the tank.

A washing sink with two compartments is required, one for the



soapy water and one for rinsing. These trays or sinks may be purchased from dairy supply houses. A steam or water turbine for operating the bottle and the can-cleaning brushes can be bought ready to attach to the sink.

If the milk is to be distributed in bottles, it will be well to have, also, an attachment for rinsing and sterilizing them in crate lots. A suitable device for sterilizing the cans may be made by any hospital steamfitter or plumber by running a horizontal steam pipe for a few inches along the back part of the trays, with upright branch pipes 6 or 8 inches apart. These upright pipes are capped and have several small perforations to allow the escape of steam for sterilizing the cans. As they are washed, the cans are inverted over the pipes and the steam turned on for a few minutes.

A rack made of galvanized pipe with galvanized strap iron shelves is required to receive the sterilized cans. The cans are, of course, not dried inside with towels, but inverted on the racks, drained, and left end down until needed.

An attachment on the wall is also needed, which consists of a cold water pipe, a hot water pipe, and a steam pipe, each with its own valve and connected to a common outlet, with a steam hose attached. With this hose cold water, hot water, and steam for cleaning the room and sterilizing the milk tank are obtainable.

The washing of the small milk cans or bottles in the ward kitchens or serving rooms is not a good plan. They should be merely rinsed there and then thoroughly washed and sterilized by the trained worker in the central milk room, thus insuring well cared for utensils. The use of milk cans rather than bottles is preferable for ward service, in that breakage is avoided; also, few ward refrigerators are large enough to hold a full supply of bottles. For the private service, half-pint bottles opened at the bedside are excellent.

For serving milk to the dining-rooms of the doctors, nurses and employees the use of a large can is not advisable. Such cans, having wide openings, allow the use of a ladle for filling tumblers for table use. There is temptation for a careless person in the serving room to drink from the ladle and thus infect the milk. It is suggested that the hospital tinsmith make a can of suitable capacity for the meal, with an inside bottom sloped to a sanitary faucet. The tops should be too small to admit a ladle, or else should be locked on. Cream should be handled just as the milk is handled.

It is of prime importance that the worker on duty in the milk room should not be a carrier of infection. The average employee cannot be trusted to report of his own accord that he is ill before he is in a condition to do damage. Each day before going on duty he should be obliged to report to some physician in the hospital. The throat should be examined, also the hands, which should have no septic abrasions. It has been found convenient to have the worker report to the bacteriological laboratory for this examination. If there is any suspicion of sickness a throat culture is taken and the worker is not allowed in the milk room.

A careful allowance of milk per capita for each class of patients will result in the saving of unnecessary waste. For the children's and medical wards there should be a liberal allowance, and also for the sicker surgical cases. Less milk is required for the convalescent surgical cases. Let the head nurse send in a daily requisition for milk stating the number of patients in her ward. From such lists a sheet can be made out for the milk room. As the cans are filled for the day's supply each should be marked with a tag showing the ward for which it is intended. If the milk is sent to the wards three times a day, rather than once, smaller cans, which are easy to handle, may be used, and the supply is more likely to hold out.

If a hospital can afford to install and operate its own pasteurizing apparatus, so much the better. It is, however, an expensive process, and if done at all must be carefully attended to in every detail lest more harm than good result.

B. H. ANTHONY.

NEWTON, McG.: Chronic Appendicitis in Children, with Report of Cases. *Southern Medical Journal*, March, 1920, xiii, 166.

The author remarks that in studying appendicitis in children the fact that it is more violent in its onset, and that liability to perforation with subsequent diffuse peritonitis is greater at this period of life than later, is emphasized to such an extent that we are apt to lose sight of the frequency with which chronic appendicitis occurs in children. As a result of this we fail to appreciate the part played by a "chronic appendix" with adhesions, in the production of the many digestive disturbances in children. These digestive disturb-

ances are often misinterpreted and ascribed to cyclic vomiting or recurring acidosis (or worms—Abstr.), and treated as such.

Several factors contribute to the difficulty of recognizing the true condition. Chief among them is the absence or unreliability of a history of an acute attack, which may have occurred in infancy, when a satisfactory physical examination was impossible and the condition remained unrecognized. Then there is our lack of understanding of its symptom-complex, but this, the author hopes, will be overcome as our opportunity to study these cases is increased. For the improvement in the technic of gastro-intestinal radiography has been a distinct aid, which the author believes to be of great service in assisting us to a correct diagnosis in the case of children who suffer from repeated disturbances of the gastro-intestinal tract.

The remainder of the article is devoted to the report of several cases illustrating the author's contentions.

M. KESCHNER.

VALLÉE, A.: Multiple Infarcts of the Spleen in Malignant Endocarditis, Rupture of the Spleen, and Peritonitis. *Canadian Medical Association Journal*, December, 1919, ix, No. 12, p. 1,064.

Professor Vallée reports the case of a man of forty-five, addicted to alcohol, who was admitted to the Hotel Dieu Hospital, Quebec, in July, 1917, suffering from cardiorenal disease. On examination, there was found to be evidence of mitral and aortic insufficiency, albuminuria, numerous hyaline casts, red blood-cells, abundant leukocytes and renal cells, with edema and ascites. Early in September, in addition to the above symptoms and without their aggravation, the quantity of white cells in the blood became so abundant as to be recognized as pus. At this time an irregular rise in temperature with remissions also developed, suggesting a possible suppurative lesion in the kidney. Four or five days before death the patient began to complain of excruciating pain, at first in the right hypochondrium and later in the left. This pain disappeared later but increased again on the evening before death, when it was localized definitely in the left upper portion of the abdomen. There was no distension of the bowels.

The autopsy showed adhesions of the entire pleura with slight



congestion of both lungs. The pericardium contained a few grams of yellow fluid with milky patches on the visceral layer. The heart weighed 450 grams. By the water test a wide insufficiency of the aortic valve was readily demonstrated. This valve had a few simple vegetations on its upper surface and many ulcerative ones facing the ventricle. The vegetations were dark in color and pushed the sigmoid cavities to the aortic wall. The slightly thickened edges of the commissures were dull and white. The mitral valve was slightly sclerosed along its margin, with trabeculæ scattered all over it, and two small vegetations were seen on the auricular surface near its margin. These vegetations were 3-4 mm. in diameter, resembling brownish colored mulberries, and they were scarcely adherent. The remaining valves showed nothing except sclerosis. The parietal endocardium was slightly thickened, and sclerosed in the metro-aortic region. Myocarditis with slight hypertrophy of the left ventricle was evident.

Atheromatous patches were scattered over the entire aorta; they were not calcified and were very numerous and large in its abdominal portion.

The omentum, mesentery and intestines showed recently formed pseudomembranes. The parietal and visceral portions of the peritoneum were hemorrhagic, and the abdomen contained a few liters of dark brownish fluid. The appendix, stomach, intestines and pancreas were normal. The liver weighed 1,750 grams and was hyperemic. The spleen was large, soft, almost fluctuating and friable. Its weight was 415 grams. Its capsule was slightly thickened, covered with exudate, which was deep yellow in color at the upper pole, and purple-gray at the lower pole. It presented many slashed irregular ruptures, not unlike some large cavities in a tuberculous lung. On section, a typical immense yellowish-pinkish infarct was found, with its base to the outer side of the organ and the apex of the hilum. All blood-vessels in the centre of the infarct were thrombotic. The pale infarct could readily be distinguished from the dark red splenic tissue in which the circulation had not been disturbed. The ruptures, which were covered with pus, had carved up the organ in different ways. Thick black fluid characteristic of suppurative lesions of the spleen filled numerous cavities in the interior of the viscus. Its general appearance was not unlike that of gangrene of the spleen following diffuse abscess. The left kidney weighed 210 grams, and was congested; its capsule was thick and easily removable; there were cica-

trices of old infarcts; the pyramids showed petechial hemorrhages; the cortex was thin, with evidences of hyaline degeneration. The right kidney was similarly affected. Microscopical examination of all the organs verified the gross lesions. Bacteriological examination of the spleen showed many isolated and a few small clumps of Gram-positive cocci—they appeared to be staphylococci. No cultures had been made.

From the history and anatomic examination Vallée concludes that the patient was suffering from a malignant subacute endocarditis, with subacute nephritis and pyemic infarcts of the spleen, and that the latter were the cause of the rupture of this organ, and of peritonitis, the infection being probably due to staphylococci. He remarks that, as a general rule, infarcts are quite common and are not always fatal, especially when they are not of an infective nature. They may disappear, leaving only sclerosis and a scar, such as the kidneys in this case showed. Abscess of the spleen, on the contrary, is not frequent. Osler, however, the author states, points out that the most frequent of these abscesses is one which follows a septic embolus and which can only be diagnosed at the autopsy. Rupture of the spleen does not always follow abscess due to infarct, Osler being the only author, according to Vallée, who mentions the fact.

(It is to be regretted that the blood was not studied culturally during the patient's life-time.—Abstr.).

M. KESCHNER.

HARTMAN, F. A., AND LANG, ROSS C.: The action of Adrenalin on the Kidney. *Endocrinology*, July-Sept., 1919, iii, No. 3, p. 321.

In studying growths of kidney volume where adrenalin was added to the perfusion fluid, injected into the jugular vein or applied to ganglia, the authors noted that adrenalin in moderate amounts produces, in some cases, a dilatation of the vessels, which is usually preceded by a brief constriction. This dilatation or constriction may be brought about by the action of adrenalin on the semilunar ganglion, dorsal root ganglia, or some structures within the kidney.

L. C. JOHNSON.

## SECTION ON

### LABORATORY AND RESEARCH

DUVAL, C. W., AND HARRIS, W. H.: The Antigenic Property of the Pfeiffer Bacillus as Related to its Value in the Prophylaxis of Epidemic Influenza. *The Journal of Immunology*, Sept., 1919, iv, No. 5, p. 317.

The authors used influenza bacilli killed by chloroform for their vaccine. Out of a total number of their group series, 2,608 persons who received the complete treatment of vaccine (3 injections), or 98.3 per cent, did not contract the disease. Out of the total number of 346 who received only 2 injections, 92 per cent did not contract the influenza during the first epidemic. Seventy-six per cent of the 118 receiving one injection did not develop the disease. This latter group shows a marked difference in the percentage of infection compared with those receiving the full treatment. It is noteworthy that in those vaccinated who developed influenza the character of the infection was mild and without pneumonic complications. There were 866 individuals, forming a part of the forces vaccinated, who refused injection; 375 of these, or 41 per cent, developed influenza as contrasted with an occurrence rate of only 3.3 per cent for those vaccinated. While the authors realize that the number of persons vaccinated is too small to draw any sweeping conclusions relative to the percentage of absolute protection afforded, and the duration of the immunity, they believe that even in these relatively few cases the results indicate specificity of the Pfeiffer bacillus and efficacy of the vaccine as a prophylactic against the infection.

A survey of the results of the series of cases, taking into account only those who did not contract the disease during the second epidemic, indicate two or three months as the average duration of protection afforded by the injection of the chloroform-prepared Pfeiffer vaccine.



During the height of the epidemic in New Orleans the authors vaccinated more than 5,000 persons with a specially prepared protein suspension of the Pfeiffer bacillus. Of this number approximately 90 per cent did not contract influenza, either during the period of the epidemic or of its recurrence two months later. This percentage, compared with that of their group controls (those refusing vaccine) and the city statistics, indicates that a considerable degree of protection was established in the case of those who were completely vaccinated, and it is reasonable to suppose that the protection was the result of the inoculation with *Bacillus influenzae* antigen.

Chloroform as a germicide in the preparation of vaccine has a distinct advantage over all other agents commonly employed. The use of heat, tricoresol, etc., for killing the culture, while effective from a germicidal point of view, injures to some degree the immunizing property of the protein, and particularly is this the case with *Bacillus influenzae*.

While the duration of specific antibodies in the blood of the host varies within wide limits for different individuals, it may be said that these substances remain in the circulation for a period of ten weeks on the average, as shown by the agglutination and complement-fixation tests. In many isolated cases these tests are positive six months after vaccination.

From observations in their series of vaccinations the authors believe that there is every indication that the influenza protein employed gives rise to the production of protective substances and therefore justifies its use in the prophylaxis of epidemic influenza.

W. LINTZ.

PARKER, J. T.: The Poisons of the Influenza Bacillus. *The Journal of Immunology*, Sept., 1919, iv, No. 5, p. 331.

*Bacillus influenzae* produces a filterable poison which is lethal to rabbits when given intravenously. The poison is only partly destroyed when heated to 131° F. (55° C.) for half an hour. When it is heated to 167° F. (75° C.) for half an hour or boiled for five minutes, over two-thirds of its toxicity is lost. Rabbits can be immunized to at least 4 or 5 minimal lethal doses of this poison. From  $\frac{1}{4}$  to 1 c.c.

of the immune serum can neutralize, *in vitro*, 1 to 2 lethal doses of the poison. From 5 to 10 c.c. of the immune serum, when given intravenously fifteen minutes before or after the injection of 1 to 2 lethal doses of the poison, will usually save the rabbit. From 5 to 8 c.c. of immune serum, when mixed *in vitro* with at least 3 minimal doses of the poison, will save about 50 per cent of the rabbits. Influenza bacterial extracts, fresh or autolyzed, are poisonous to rabbits in relatively large amounts. The symptoms are the same as with a sub-lethal dose of the broth filtrate. A dose corresponding to one-half of a heavily grown slant of *Bacillus influenzae* will kill 50 per cent of the rabbits injected.

The Berkfield filtrate of the bacterial extracts is nearly as toxic as the extracts themselves. Boiling this filtrate does not destroy its toxicity. The immune serum has no effect *in vitro*, even in large amounts, in detoxicating the bacterial extracts. Antiserums produced by immunizing with vaccine of *Bacillus influenzae* do not neutralize *in vitro* a lethal dose of the broth poison. While the evidence is by no means conclusive, it seems probable that the poison of *Bacillus influenzae* contains two poisons: the first, the more important one, a true soluble toxin, filtrable, thermolabile, against which antitoxins can be produced; the second, present also in the vaccine of *Bacillus influenzae*, also filtrable but differing from the first in its thermostability, and in the fact that it is not detoxicated by the antitoxin.

W. LINTZ.

OLITSKY, P. K., AND KLIGLER, I., J.: Toxins and Antitoxins of *Bacillus Dysenteriae* Shiga. *The Journal of Experimental Medicine*, Jan. 1, 1920, xxxi, No. 1, p. 19.

Studies of the toxic products yielded by the Shiga bacillus led to the conclusion that this organism growing *in vitro* produces two poisons, one an endotoxin, and the other an exotoxin, which can be separated experimentally and can also be shown to attack different anatomical structures of the rabbit and to set up two distinct kinds of pathologic effects.

Shiga first pointed out that the bacillus is highly toxic for the rabbit, and this animal has remained the chief one for experimental

study of the organism. The bacillus—or its poisonous products—produces lesions in the intestines and also in the central nervous system. The intestinal lesions consist of greatly thickened, inflammatory, edematous large intestine, the mucous membrane of which is yellowish white, more or less hemorrhage being present. The central nervous system is usually the seat of serious lesions, which may occur at any portion of the system, although the medulla is most often affected. The gray matter—and almost exclusively the anterior horns—shows chromatolysis of the neurons to a varying degree. The white matter is intact. The lesion is that of an acute myelitis, often of anterior poliomyelitis, and sometimes, of polioencephalitis.

The exotoxin was prepared as follows: Plain meat infusion broth was mixed with  $\frac{1}{3}$  volume of 10 per cent egg albumen. The latter was prepared by adding 1 volume of egg-white to 9 volumes of distilled water. The mixture was pH 7.6 to 7.8 and was autoclaved for 45 minutes at a pressure of 15 lbs. The medium was inoculated with one-half an agar slant of a twenty-four hour culture of Shiga bacillus and incubated at 37° C. During the incubation the contents of the flasks were shaken from time to time, to increase aëration. After five days the culture fluid was filtered through a Berkefeld N candle. The filtrate constituted the exotoxin.

The endotoxin was prepared as follows: Shiga bacilli were grown in Blake bottles for twenty-four hours. The growth was washed off in saline solution, 15 c.c. to each bottle, incubated for two days at 37° C. and filtered through a Berkefeld N candle, the exotoxin being destroyed by either exotoxic serum or by heat.

The study of the nature and effects of the poison of this microorganism is thus simplified. The two toxins are physically and biologically distinct, the exotoxin being relatively heat-labile, rising in an early period of growth, and yielding an anti-exotoxic-immune serum. The endotoxin, on the other hand, is heat-stable, is formed in the latter period of growth, and is not neutralized by the anti-exotoxic serum. The exotoxin exhibits a specific affinity for the central nervous organs in the rabbit, giving rise to a characteristic lesion—mainly, necrosis, hemorrhage, and possibly a perivascular infiltration in the gray matter of the upper spinal cord and the medulla. The endotoxin exerts a typical action on the intestinal tract, producing edema, hemorrhages, necrosis, and ulcerations in the large intestines. In dysentery in man intestinal lesions pre-



dominate, but in severe epidemics paralysis and neuritis have been observed. These facts become especially significant from the standpoint of the serum therapy of bacillary dysentery. A potent anti-dysenteric serum should contain antibodies against the exotoxin as well as against the endotoxin. That such a serum can be produced in horses has been experimentally demonstrated.

H. M. FEINBLATT.

CLARK, P. F., AND RUEHL, W. H.: Morphological Changes During the Growth of Bacteria. *Journal of Bacteriology*, 1919, iv, 615-629.

The authors studied seventy strains of organisms of which thirty-seven species were pathogens at brief intervals for a period of forty-eight hours, and at longer intervals for a week. In all instances except in the diphtheria group and *Bacillus mallei*, young organisms from four to nine hours old are much larger than the forms found in the twenty to twenty-four hour culture. The difference is so great that they are almost unrecognizable as compared with the standard twenty-four hour culture. The largest forms correspond closely to those found during the period when the cell is dividing most rapidly. In diphtheria the younger organisms are small and stain more solidly than the older forms. It is important that the morphology of the pathogenic organisms at different periods of growth should be known in making a bacteriological diagnosis.

F. HULTON-FRANKEL.

CHENEY, E. W.: A Study of the Microöganisms Found in Merchantable Canned Foods. *Journal of Medical Research*, July, 1919, xl, No. 2, p. 177.

The author thus summarizes his work: Seven hundred and twenty-five cans of merchantable foods in prime condition were carefully examined for bacteria, moulds and yeasts. The range of materials was wide, including the usual market brands of meat, fish, vegetables and fruit. All samples examined were purchased in the open market. Before analysis each can was incubated at 37° C. for

at least ten days. Special precautions were taken to exclude outside contamination during examination, and particular media were used to assure the growth of any organism that might be present in the sample. Fifty-eight out of seven hundred and twenty-five, or 8 per cent, of these cans, were found to contain living microorganisms. Not all foods contained organisms, some being found always sterile, some with a constantly low percentage, others with a high percentage of cans containing living organisms. There was a uniform average found throughout for each food, vegetables being sterile or showing only a small number of cans containing viable organisms (8 per cent), fruits showing a considerably lower number (3 per cent), fish and meats varying from 10 to 20 per cent. The organisms isolated constitute a sharply limited group of resistant spore bearers, including the *Bacillus subtilis mesentericus* group, the related thermophils, an anaërobe, four common species each of *Aspergillus* and *Penicillium*, and two border-line yeasts. No pathogenic organisms were found. The bacteria were associated chiefly with the meats, while the moulds formed the sole flora of all the fruit cans found to contain living organisms. Thermophils were found only in crab and lobster. There was evidence to suggest that in certain foods the bacteria and moulds had persisted through the processing, and that the usual methods of processing must be improved to obtain actual sterility in these foods.

TASKER HOWARD.

THJØTTA, T.: On the Bacteriology of Dysentery in Norway.  
*Journal of Bacteriology*, 1919, iv, 355-378.

The author, as a result of a detailed study of 65 cases of dysentery, proposes a serological classification for the types of organisms causing dysentery. He divides all dysentery organisms into three classes—Group I, the Shiga type; Group II, the Flexner, Strong and Y type; Group III, the Group III of Sonne. The article gives a detailed description of the cultural and serological characteristics of each type.

F. HULTON-FRANKEL.

THJØTTA, T.: On the Bacillus of Morgan No. I. A Metacolon Bacillus. *Journal of Bacteriology*, 1920, v, 67-77.

The bacillus of Morgan was isolated from 9 cases of diarrhea or dysentery-colitis. Two of the colitis cases ended fatally. The bacillus alters its characteristics considerably when grown for any length of time on artificial media. Serologically the bacillus shows no relation to the typhoid, paratyphoid, colon or dysentery bacillus I, II or III. The different strains of the Morgan bacilli themselves do not show any serological relationships. Since this organism resembles the colon bacillus serologically the author is of the opinion that the name metacolon bacillus is the proper one. There is still a question in the author's mind as to whether this bacillus, or dysentery, is the etiological factor of the diarrhea, and for the present he considers that he has proven only that the metacolon bacillus is a saprophytic colon bacillus which thrives well in the inflamed intestine.

F. HULTON-FRANKEL.

KOHMAN, E. F.: The So-called Reduced Oxygen Tension for Growing the Meningococcus. *Journal of Bacteriology*, 1919, iv, 571-583.

These experiments show that the value of replacing part of the air in which the meningococcus is growing by CO<sub>2</sub> (about 10 per cent) lies in the fact that the CO<sub>2</sub> present acts as a buffer and prevents any great change in the p H of the medium. The meningococcus is exceedingly sensitive to changes in the p H, growing best on a 4 per cent defibrinated human blood agar at a p H between 6.7 and 7.4. If part of the air is replaced the optimum p H lies between 7.6 and 8.4. The less viable organisms will sometimes not grow at all or only poorly in air on a medium of any reaction, but will grow if 10 per cent of the air is replaced by CO<sub>2</sub>. Pneumococcus and streptococcus will also grow on the medium if the p H lies between 7.8 and 8. Dr. F. Gates has shown the same effect, but did not bring out the point that meningococcus really grows more vigorously if the reaction of the medium is slightly alkaline and is brought to the correct p H by CO<sub>2</sub> rather than neutralized by a mineral acid.

F. HULTON-FRANKEL.



SOLOMON, H. C.: Non-concomitance of Spinal Fluid Tests. *American Archives of Neurology and Psychiatry*, Jan., 1920, iii, 49-56.

There are five laboratory tests commonly applied to the spinal fluid in the diagnosis of disease of the central nervous system, namely: (1) Wassermann reaction; (2) test for globulin; (3) test for increased albumin; (4) cell-count (increase called pleocytosis); (5) Lange's colloidal gold test. A positive Wassermann reaction in the spinal fluid is practically specific for neurosyphilis. A positive result in the other tests, in a general way, indicates a pathologic reaction of an inflammatory nature in the central nervous system. In meningitis, encephalitis, tumor with meningitis syphathica, vascular insults with secondary inflammatory reaction, traumatic injury, and multiple sclerosis, these four tests are generally positive. In paretic or tabetic neurosyphilis all five are usually positive.

The Wassermann reaction in the spinal fluid is a biologic reaction pathognomonic of syphilis of the nervous system. The so-called Wassermann body, whatever that substance may be which produces deviation of complement, is an unknown element. There is some evidence to show that it is related to the albuminous content of the blood serum and, by analogy, therefore, to the albuminous content of the spinal fluid. However, there is evidence, such as that brought forth by McDonagh, that it is a lipoid element with which the Wassermann reaction is associated. The evidence presented in this paper is against there being a connection between the Wassermann reaction and globulin or albumin.

It is of course evident that there is no relation between the Wassermann reaction and pleocytosis. Pleocytosis is evidence of inflammation, the Wassermann reaction of syphilis.

Globulin is defined as an albumin which is salted out of solution by half saturation with ammonium sulphate. Globulin does not occur normally in the spinal fluid, and when present is a pathological finding. If it is present in the spinal fluid, it indicates, theoretically, that there is an increase in the total amount of albumin, as it represents the addition of an albuminous substance to the albumin normally present. While the globulin, albumin, and pleocytosis are evidence of inflammation, it does not follow *a priori* that they are

dependent one on the other or must be present together. They are quite different elements. The same is true of the Wassermann in relation to globulin and albumin.

The chemical nature of the substance which produces the colloidal gold reaction is not clearly defined. The colloidal gold reaction is a method of differentiating albumins, and was used by Lange in the endeavor to classify the type of globulin occurring in the spinal fluid. Without having succeeded in making this classification, he did discover this practical test. Our clinical experience has shown that the gold reaction may be obtained with a fluid that gives no precipitation with half saturated ammonium sulphate.

Although usually present together and in a general way indicative of the same pathologic condition, each reaction is produced by a distinct chemical element which may be present alone (except that theoretically globulin indicates an increase in the total amount of albumin, as globulin is a special albumin). Thus one may find the Wassermann reaction positive, all other tests negative, a positive colloidal gold reaction as the only positive finding, only a pleocytosis, or merely an albumin increase. Further, they may occur in various combinations. This is theoretically possible on the basis of difference in chemical constitution, and does actually occur.

Additional evidence of the independence of each element is furnished by the result of treatment of cases of neurosyphilis. It is shown that the tests, at first all positive, often become negative one at a time, and that the different combinations are left positive, or that only one is left positive.

### CONCLUSIONS

(1) There is a non-concomitancy of the inflammatory elements of the spinal fluid commonly tested for in diagnosis of disease of the central nervous system.

(2) Any one may be present or absent when the others are present—with the exception that globulin presages an increased amount of albumin.

(3) No spinal fluid can be considered negative in which all these tests have not been used.

(4) No one element tested for contains the element or fraction

that gives another test, except that the total albumin contains the globulin fraction, in part at least.

(5) In neurosyphilitic cases receiving treatment these substances disappear at rates which vary in different cases, so that no general law can be laid down as to which element is most easily affected by treatment in any particular case, although in general the pleocytosis disappears first.

(6) The presence or absence of these products of inflammatory reaction does not always reflect the clinical change in the case of treated neurosyphilitic patients.

S. E. JELLIFFE.

GOTTLIEB, M. L.: Experimental Purpura. *The Journal of Immunology*, Sept., 1919, iv, No. 5, p. 309.

Hess, who has studied this condition carefully, suggests that in the blood stream of patients with purpura there exists a toxic substance which has the power of dissolving the blood-platelets and of rendering the erythrocytes easily laked by heterotonic salt solution, and that this substance causes a disturbance in the nutrition of the lining of the blood-cells. He believes that the reduction in the number of blood-platelets is more apparent than real, and comes to this conclusion after an experimentation by which he finds that although the number of visible blood-platelets be reduced, the remaining portion exists in solution in the blood stream.

Gottlieb obtained guinea pigs' blood-platelets, which he injected into a rabbit; this rabbit serum developed the power of destroying guinea pigs' blood-platelets. He injected this specific rabbit serum into a normal guinea pig, which resulted in a tremendous destruction of the normal guinea pig's blood-platelets, and the development of the pathologic lesions and symptoms of purpura. Hemorrhages were seen in the various tissues and organs of the body; the coagulation time was not preceptibly prolonged, but the bleeding time was definitely prolonged. Normal guinea pig serum seems to have the effect of counteracting this antiplatelet serum.

W. LINTZ.



CHACE, A. F.: The Value of Chemical Blood Examination in Diagnosis, Prognosis, and Treatment of Some Constitutional Conditions. *The Medical Clinics of North America*, Sept., 1919, iii, No. 2, p. 389.

In a case showing an exacerbation of chronic nephritis dyspnea was a pronounced feature. By estimating the  $\text{CO}_2$  content of the blood, this was found to be due to an acidosis. Dyspnea occurring in the course of a nephritis and unaccounted for by cardiac decompensation is practically always indicative of acidosis.

The creatinin content of the blood is of great value in prognosis. In the case presented the creatinin content of over 5 mg. per 100 c.c. of blood determined the fatal prognosis, even though, according to the clinical evidences, the case was apparently improving while under treatment.

The other important points summarized are the diagnostic determination between essential hypertension and chronic nephritis, made by examining the blood for the amount of the nitrogenous waste products, and the analysis of the blood for its salt content, for the purpose of establishing the diagnosis of uncomplicated parenchymatous nephritis.

H. WOLFER.

HANZLIK, P. J., AND WEIDENTHAL, C. M.: The Hemostatic Properties of Thromboplastic Agents Under Different Conditions. *The Journal of Pharmacology and Experimental Therapeutics*, October, 1919, xiv, No. 2, pp. 189-210.

The favorable results obtained with kephalin and the thromboplastins on oxalated plasmas and peptone bloods *in vitro* indicate that these might act as hemostatics when applied to wounds irrigated under favorable conditions.

Irrigations were made with the agents in saline, using normal saline as control. The denervated foot-pad of the dog was used, and the cessation of bleeding (bleeding time) was used as the index of hemostasis.

Sixteen experiments were made upon the larger vessels, such as the femoral arteries of dogs and cats. The arteries were dissected out in both Scarpas triangles, leaving a recess in which the blood col-

lected and the clot attached itself to the walls. One artery was painted with kephalin, or the thromboplastin was used; the other was left untreated.

Other tests were made upon hemorrhage from bone and liver wounds, and in one case of hemophilia.

The hemostatic effects of the thromboplastic agents tested on superficial hemorrhage from the dog's pad, although limited, tended to correspond with their power to accelerate the coagulation of blood and plasma *in vitro*. Accordingly thromboplastins and kephalin were among the most active, followed by saline and coagulen; hemostatic serum was doubtful or inactive.

The experiments above mentioned upon the femoral arteries proved the method to be unsatisfactory. The application of thromboplastic agents to bone and liver wounds proved unsatisfactory, there being no shortening of bleeding time.

The administration of 61.73 grains (4 grams) of kephalin by mouth to a hemophiliac suffering from intestinal hemorrhages was followed by prompt stoppage of the bleeding, shortening of the coagulation time and of the bleeding time. This is not interpreted as necessarily due to the kephalin, since bleeding in this patient was known to have stopped spontaneously before the treatment.

H. M. FEINBLATT.

RAPPLEYE, W. C.: Blood Plasma Chlorids *versus* Renal Function.  
*The Boston Medical and Surgical Journal*, January 22, 1920,  
clxxxii, No. 4, p. 89.

The significance of the chlorid content of the blood is imperfectly understood. The threshold for excretion of sodium chlorid is constant in the blood and is 562 mg. per 100 c.c. plasma. The threshold for sodium chlorid secretion is not constant but varies in health and is influenced by disease and drugs. In dropsical renal disease the secretion threshold is elevated, indicating a lowered kidney ability to excrete sodium chlorid. In certain cardiac and renal diseases there is a relatively increased concentration. The threshold may be temporarily or permanently lowered in fevers, diabetes, or by the action of diuretics or heart tonics. Edema is usually accompanied by a relative increase of concentration of the

chlorids in the plasma, and chlorids and urea functions are quite independent of each other. The author undertook a study of 104 cases, of which none showed edema, cyanosis, or dyspnea, or anything to compromise the excretory rate. The ages of the patients varied between forty and eighty-five years, the majority being over fifty. None were taking drugs. Blood was drawn before breakfast. In each case plasma chlorids, phthalein, blood-urea nitrogen, blood-pressure, and specific gravity of the urine were tested. No relationship could be established between the chlorid values and the blood-urea nitrogen, rate of elimination of phenolsulphonephthalein, blood-pressure, or specific gravity of the urine. A second group of 40 cases was studied and plasma chlorids were determined four hours after a regular meal. Eighty-five per cent of cases showed a definite increase of plasma chlorids after a meal. A small group of cases of so-called essential vascular hypertension was studied and showed an elevated renal threshold for sodium chlorid. Attempts to lower the threshold gave no conclusive results.

M. M. BANOWITCH.

MILLS, C. A.: The Activity of Lung Extracts as Compared to Extracts of Other Tissues in Inducing Coagulation of the Blood. *Journal of Biological Chemistry*, 1919, xl, 425.

This work owes its inception to the discovery by Wherry and Ervin that intravenous injection of extracts of tuberculous lung tissue and of normal lung tissue would produce death in a few seconds in rabbits and guinea pigs. The work was undertaken to discover the cause of death in these cases. Preliminary experiments showed that larger or smaller clots were always formed in the heart or vessels, and that while the death resembled that of anaphylaxis the lungs were always found to collapse when the thorax was opened. These results suggested the investigation of the peculiar power of the lung tissue in causing thrombosis. The results of the detailed experiments are summarized as follows:

(1) Sudden death from the intravenous injection of lung tissue extract is apparently due to intravascular coagulation, although there is a possibility of an anaphylactic effect on the lungs, not sufficient, however, to keep them from collapsing on the opening of the thorax.



(2) Tissue extracts were tested as to their thromboplastic activity on the blood, both intra- and extravascularly. Lung extracts were found to be far more active than the extracts of any other tissue; kidney ranked second, and then heart, brain, spleen, thymus, testes and skin, somewhat in the order named. The remaining tissues were weakly active as compared with the lung, some of them showing very slight thromboplastic action.

(3) Lung tissue offers a possible source for the preparation of a strong hemostatic.

(4) The strong coagulative activity of lung and kidney tissues and, to a lesser degree, of skin, suggests a possible protective mechanism against hemorrhage.

W. H. EDDY.

SOMMER, H. H., AND HART, E. B.: The Heat Coagulation of Milk. *The Journal of Biological Chemistry*, 1919, xl, 137.

The heat coagulation of milk is of importance in connection with the preparation of condensed milk. Coagulation in sterilizing often occurs and causes serious loss to the industry. The authors have investigated the following factors, in the attempt to explain the difference in coagulating points with different samples: titratable acidity, hydrogen-ion concentration, concentration of the milk, and composition and balance of milk salts. They find the main factor to be the composition of the milk salts. Apparently casein requires a definite optimum calcium content for its maximum stability. This Ca content is largely controlled by the magnesium, citrates and phosphates present. In fresh milk there is no relation between titratable acidity and heat coagulation. Acid fermentation of milk lowers the coagulating point by changing the reaction and lowering the citric acid content, but it is impossible to use the acidity of the milk as a criterion of coagulability. Difference in concentration accounts partly for the difference in coagulation of fresh milk samples. Hydrogen-ion concentration is not the determining factor in fresh milk coagulation. It is a factor in fresh milks, and may become important in commercial milks.

W. H. EDDY.

## SECTION ON PEDIATRICS

BREWER, I. W.: The Bill of Rights of the Child. *New York Medical Journal*, Feb. 21, 1920, cxi, 323.

Brewer summarized the rights of a child as follows:

(1) Every child has a right to be born of parents who are mentally, morally, and physically sound and healthy, and approximately of the same age.

(2) During pregnancy the mother should not engage in an occupation that requires long hours or that exhausts her, and during the last month she should do no work except the lightest kind of housework.

(3) During her pregnancy the expectant mother should have the constant advice of a competent physician.

(4) At the time of delivery the mother should be assisted by a physician skilled in obstetrics.

(5) Immediately after birth a silver solution of proper strength should be instilled into the child's eyes to prevent ophthalmia neonatorum.

(6) The child should be nursed by its mother for at least nine months, and where this is impossible the feeding should be supervised by a physician skilled in the treatment of children, assisted by a competent nurse.

(7) During the preschool period the child should be under the direction of a competent medical man, who should make periodical examinations of the child's mental and physical condition. During this period the feeding of the child is of the greatest importance.

(8) During its school life the child should be under the observation of a competent physician, who must not only supervise the child

but must pay attention to heating, ventilation and lighting of the school, and take precautions necessary to prevent the introduction of communicable diseases into the school.

(9) The school curriculum should be so arranged as to give adequate instruction in hygiene and sanitation, in addition to the regular course of study.

(10) No child under eighteen years of age should be allowed to work, unless it is clearly proved that the child is mentally unable to profit by further instruction. When it must go to work the parents should not appropriate all of the child's earnings.

(11) During its minority the child should have proper guardianship. The importance of guarding against sexual vice is shown by the fact that 5.4 per cent of the men examined for the army during 1917 and 1918 were found to have one of the venereal diseases.

M. KESCHNER.

CANTI, R. G.: Primary Pulmonary Tuberculosis in Children.  
*The Quarterly Journal of Medicine*, Oct. 1919, xiii., 49.

The findings and conclusions from 84 consecutive autopsies on children under ten years of age at St. Bartholomew's Hospital substantiate the belief of those who hold that there is such a thing as a primary lung focus due to inhalation of tubercle bacilli.

Ghon found 92.4 per cent so infected, in a series of autopsies. Of his 84 autopsies the author reports 16 cases showing tubercular lesions. By the aid of diagrams, the primary lesion, which is usually single, situated near the surface of the lung, and about the size of a pea, was shown in these cases never to be more recent than the mediastinal glands which drain that part of the lung containing the tubercle. Furthermore, this focus was older than any other focus in the body. In practically all cases, when tuberculous mediastinal glands were found, a primary lung focus was found, closely related to them anatomically.

Eastwood and Griffith, in studying the bacteriology of apparently primary foci, usually isolated the human type in thoracic tuberculosis and the bovine type in alimentary tuberculosis, even though the disease had become generalized. It is also pointed out that when the primary focus appears to be elsewhere than in the lung, there is



almost a constant absence of a lung focus, and vice versa. When a lung focus is present, there is almost a constant absence of evidence that the portal of entrance is elsewhere. It is of interest to note the order of frequency in which the primary focus was found in various localities in this series:

Upper right lobe.....	30.9 per cent
Left upper lobe.....	23.2 per cent
Right lower lobe.....	22.5 per cent
Left lower lobe.....	15.4 per cent
Right middle lobe.....	7.7 per cent

T. B. GIVAN.

VAN DERSLICE, J. W.: Spasmophilia. *Illinois Medical Journal*, Feb., 1920, xxxvii, 82.

In his introductory remarks the author reviews briefly the work of Soltmann, Thiemich and Baginski. In the latter's thesis of 1904, he grouped into one category all convulsive disorders which were without anatomical basis and which could be recognized by measurable mechanical and electrical overexcitability of the nervous system. It is this exaggerated irritability of the nervous system which constitutes the peculiarity of spasmophilia.

No clinical method has as yet been devised by which the mechanical irritability of nerves may be measured; electrical examination, however, gives a more exact means of determining the extent of this irritability. Erb noted an increased faradic and galvanic irritability in the tetany of adults. These were confirmed in infants and by a series of comparative investigations with a large number of children; from these data a typical law of contraction was deduced. This law, stated in its simplest terms, is that the cathodal opening contraction in the normal is above 5 ma. while in the spasmophilic it is under 5 ma. By means of this test it is found that conditions which have previously been classified as eclampsia, tetany, laryngismus stridulus, etc., can now be grouped under the term of spasmophilia.

The etiology of spasmophilia is as yet unknown. Except for passive congestion of the central nervous system no characteristic

changes have been found in cases coming to autopsy. In a series of chemical examinations of these brains made by Czerny, a diminution of the calcium salts was found; others have found disturbances of metabolism of the alkaline salts.

There is no doubt that heredity plays a very important rôle in the etiology of the condition, which is frequently encountered in families with a neuropathic taint. Digestive disturbances seem in many cases to be an exciting cause of the individual attacks. The disorder is more frequently met with in artificially fed children. The effects of parathyroid disturbance on the production of the condition have not as yet been definitely ascertained. The disease is more prevalent in the winter and early spring months than at other times.

The author discusses the symptomatology of the disorder under the headings of: eclampsia, laryngospasm, tetany, and cases without clinical manifestations which can be discovered only upon careful physical examination.

*Eclampsia.*—The eclampsia of infants is characterized by localized or generalized convulsions, which tend toward complete recovery during early life. The seizures consist of a primary tonic, with a secondary clonic stage; they are preceded by an aura during which the child appears anxious, inattentive, and extremely restless. After a few seconds or minutes (of the aura) the little patient becomes suddenly pale and loses consciousness; at the same time the facial muscles become tonically contracted. With each paroxysm these contractions may or may not extend to the entire body. When they are wide-spread, the patient's body becomes rigid as though it were suddenly shocked by a powerful electric current. The breathing is of a staccato type, often loud and approaching a cry. There is considerable cyanosis and profuse sweating. Gradually the convulsion subsides, the body becomes relaxed, and consciousness returns; the attack is, however, not followed by the sleep which follows an epileptic convulsion. This is of importance in differentiating the condition from epilepsy.

In severe cases the paroxysms may succeed each other with such great rapidity as to give rise to a status eclampticus, analogous to the status epilepticus.

In exceptional cases, the convulsions of spasmodophilia may appear but once, never to return again; usually, however, the seizures occur daily, twice a day, twenty times a day, or at intervals of weeks or

months. An acute disease or a reflex irritation may be the exciting cause of a series of paroxysms. There is no rise of temperature in an uncomplicated case of spasmophilia. Death during an eclamptic attack is relatively rare as compared with its occurrence in laryngospasm.

*Laryngospasm.*—Laryngospasm is a much milder manifestation of spasmophilia; it consists merely of a stridulous protracted “crowing” inspiration. In severe cases the glottis may become so completely closed that the little patient becomes asphyxiated. These attacks may follow irritation or excitement; laughing or crying and, in some cases, the act of nursing, may be sufficient to irritate the glottis and induce an attack. In very severe cases the interference with inspiration is very pronounced and the spasm of the glottis may extend to the diaphragm, giving rise to a variety of expiratory apnea, which may not infrequently be the cause of sudden death.

As the inspiratory phase of breathing is delayed, there is a marked slowing of the cardiac action, with at times an apparent cessation of the heart sounds for several seconds. An increase in the frequency of the cardiac beats usually precedes the relief of the apnea. As the spasm relaxes a long “crowing” stridor accompanies the prolonged inspiration; deeper inspirations follow, the stridor is diminished, and normal breathing is reestablished. Death, when it does occur, is due to cardiac stoppage, and therefore artificial respiration will be of no avail. The thrusting of a hypodermic needle into the cardiac muscle, however, may stimulate the heart to further activity. The paroxysms of laryngospasm show the same extremes in frequency and severity as those seen in the eclamptic cases.

*Tetany.*—This type is characterized by the presence of tonic convulsions of the extremities, frequently associated with paresthesias of the involved limbs. Consciousness is never lost.

The hands assume the so-called obstetrical position, with the thumbs bent upon the palm, the fingers crossing the thumb and in extension. The arm is usually flexed on the trunk, the forearm and hand flexed. The legs are not as frequently involved as the arms, but when they are involved they are flexed at the hip and knee.

These spasms appear suddenly and may last for hours or days. An attempt to overcome the spasm elicits great pain; otherwise the patients do not appear to suffer very much.

In the severer cases the convulsions may extend to the face and



neck. The muscles of deglutition, of the pupils, eyes, and of the sphincters of the bladder, may share in the involvements, but this is not very common.

Tapping of the cheek produces a rapid contraction of the muscles, as if the nerve had been stimulated by electricity. This is known as Chvostek's phenomenon.

If the nerves of the arm are compressed the hand assumes the characteristic contraction of tetany; this is the so-called Trousseau's sign. The elicitation of this phenomenon is more painful and is apt to provoke an attack of laryngospasm, so that although both of these signs are pathognomonic of tetany, Chvostek's sign is the one more frequently used for diagnostic purposes.

The course of the disease is a prolonged and extremely irregular one.

(a) *General Treatment.*—The prophylactic treatment may be summed up in three words: Breast milk, sunlight, and fresh air. The return of the child to mother's milk lessens the mechanical and electrical excitability of the nervous system. When breast milk cannot be obtained the same special milk diet can not be advised for all cases. The whey of cow's milk is dangerous. As soon as possible eggs and meat juices are to be substituted for the artificial milk; cereals, bread, butter and vegetables are to be given at an early age.

(b) *Medical Treatment.*—Calcium lactate or calcium chlorid may be given in large doses: from 20 to 30 grains (1.3 to 1.95 grams) t.i.d. Those who are enthusiastic over the calcium salts ascribe its occasional failure to the usual small doses given. Cod liver oil and phosphorus are recommended in all cases, as is also the extract of parathyroid gland.

For the attack itself it is advisable that the gastro-intestinal tract be well cleansed by a full dose of castor oil followed by the administration of bromids and chloral. For twenty-four hours all nourishment except plenty of water is to be stopped.

M. KESCHNER.

## SECTION ON ROENTGENOLOGY AND ELECTRO- THERAPEUTICS

McLESTER, J. S.: Medicine's Daily Debt to Radiology. *Southern Medical Journal*, December, 1919, xii, 735.

McLester has always felt that the internist should look upon roentgenology as a part of his field and not as a distinct specialty. According to him, to relegate all roentgenologic interpretation to the *x-ray* specialist is a mistake; the man who is familiar with the clinical history, and who has made the physical examination, should also study the roentgenographic findings, and be able to give a proper interpretation of fluoroscopic images.

In searching for focal infection an examination of the teeth and accessory sinuses is essential in every case. It is not wise or fair to the patient to extract unreservedly all dead teeth, and a painstaking investigation of the photographs of these questionable teeth with a "moderate" amount of good judgment should be included in the search. Even when teeth are still vital it is surprising to note the number of pyorrhea pockets sometimes revealed. The author illustrates the value of systematic examinations of the accessory sinuses in a variety of diseases by citing a puzzling case of recurring bronchitis under his observation, which was cleared up by the discovery of a focus of infection in the roentgenogram of a frontal sinus. The discovery and eradication of such a focus will sometimes remarkably benefit a patient suffering from hyperthyroidism.

Roentgenology has been of great aid in the diagnosis of gastrointestinal diseases. By making more plates, at shorter intervals, more and more information can be obtained from the roentgenogram, but on the other hand valuable impressions may be obtained from a fluoroscopic examination which would have been missed in a study of the plates alone.

The presence and nature of an esophageal stricture can be determined much better by the *x-ray* than by the old method of passing

sounds into the esophagus. Cardiospasm gives a funnel-shaped constriction which is regular in outline, and which may be readily distinguished from the irregular ragged contour with dilatation above usually seen in carcinoma. A diverticulum may simulate cardiospasm or perhaps cancer, but it can easily be recognized on the roentgenogram.

Delayed emptying time on the part of the stomach, failure of the pyloric end to fill out, bulbar deformity, an incisura or a niche, all suggest ulcer. In a penetrating ulcer we may observe an hour-glass constriction. Increased peristalsis with delayed emptying time, as well as a persistent deformity of the cap, is indicative of a duodenal ulcer. In all these cases, the author urges the necessity of exercising care in drawing conclusions from any single observation.

The location of gastric carcinoma is an important factor. If it is small and in a silent area distant from the pylorus it may be missed entirely, while in its usual position near the pylorus it produces obvious signs. The same six-hour residue and the same failure to fill out, with absence of duodenal cap, is seen, and the additional presence of a ragged constriction or of irregular filling defects points almost conclusively to the diagnosis of carcinoma. Syphilis of the stomach manifests itself in the roentgenogram by rapid emptying time and a constriction of the smooth outline. In this connection it is well to bear in mind that carcinoma of the head of the pancreas will sometimes push in the wall of the stomach and give every appearance of a growth of the latter organ.

To interpret correctly the puzzling picture of a six-hour retention with pyloric distortion due to reflex spasm accompanying chronic appendicitis, cholecystitis or other abdominal affections, it is important to make several successive fluoroscopic and roentgenographic studies, which must be read in connection with the clinical findings of the case.

In the interpretation of shadows in cases of suspected cholelithiasis, one must not be deceived by the shadow cast by a calcified cartilage. Disease of the gall-bladder often causes reflex gastric disturbances. As evidence of adhesions in the anatomical region, a certain fixation of the pylorus obtained in the standing and prone positions may be of significance. Persistent points of fixation near the ileocecal junction, and more particularly a patulous ileocecal valve, are both indicative of adhesions in this region and suggestive



of appendicitis. Appendicitis may reasonably be suspected when after barium feeding the appendix remains filled for forty-eight hours or longer. The irregular outline of such a filled appendix is most likely to indicate concretions in it. Diverticulitis of the bowel is indicated by pockets which remain several days in one position. Clinically this condition simulates appendicitis very closely, according to the authors, and shares honors with stricture of the ureter as a source of "disappointing appendectomies."

Carcinoma of the colon is usually revealed by a constant filling defect, tuberculosis by a failure of the cecum to fill and by the smooth outline of the colon. Adhesions of the intestines may usually be recognized by the points of fixation, spasm after the administration of atropin, and megalocolon, redundant colon and diaphragmatic hernia by typical shadows cast by these abnormalities. Carcinoma of the sigmoid or stricture from other causes must be studied after a barium meal and barium enema.

Pulmonary tuberculosis may occasionally be recognized by the roentgenogram, in the absence of all physical signs. Influenzal bronchopneumonia, and the brown induration of mitral stenosis, may simulate tuberculosis, and must be studied in conjunction with other clinical signs and symptoms. Shadows due to syphilis are usually at the base rather than the apex, and are more often confined to one lung. Bronchiectatic cavities give characteristic markings. The diagnosis of accidental pneumothorax, which may appear very difficult from the physical examination, becomes a very simple matter after an x-ray study of the chest. Small and interlobar empyemas cannot be overlooked, and pulmonary abscesses, pleuritic effusions, malignant growths, and pneumonia are easily diagnosed by means of the x-ray.

Fluoroscopy determines the size, shape and movements of the heart; the firm, sharp, contraction of the normal heart is in marked contrast to the flabby slap of a heart debilitated from myocardial degeneration. Roentgenograms taken before and after exercise indicate the functional capacity of the heart, which is from a prognostic point of view of greater importance than the determination of its anatomical integrity. A large proportion of aneurysms and dilations of the aorta would be missed were it not for roentgenology. Mediastinal or lung tumors invading the mediastinum are difficult to differentiate from an aortic aneurysm. A tumor in close relation-

ship with the aorta may share its pulsation in a very deceptive manner, and *vice versa* an aneurysm with a large coat of fibrin will sometimes fail to pulsate; this must be borne in mind during a fluoroscopic examination, but when the arch of the aorta can be distinguished from the tumor mass, a diagnosis of aneurysm is least likely. The author calls attention to the great frequency of metastatic tumors in the mediastinum, and warns against the radical removal of a malignant neoplasm elsewhere until the mediastinum has been investigated by means of the x-ray.

The frequency of ureteral kink or stricture as a cause of obscure abdominal pain is beginning to be appreciated by all clinicians since the advent of roentgenography as a diagnostic agent in disease of the urinary organs. The diagnosis of stone in the kidney and of hydro-nephrosis is rendered much easier and much more certain by roentgenology; it is well, however, to remember that not every stone casts a shadow, and that a calcified gland may look like a stone.

The appearance of an excavated sella turcica from a pituitary tumor, and the shadows cast by other cerebral tumors and abscesses (with the changes in the skull bones), are of great aid in the diagnosis of disease in this part of the body.

McLester closes his well-written article by reminding the practitioner of medicine that as precise methods of diagnosis multiply one is apt to be insidiously tempted to rely upon these and to neglect bedside examinations and the art of physical diagnosis. "Nothing," says he, "can ever take the place of keen clinical observation, and we should be on the alert always to develop this faculty rather than to permit it to become dulled."

M. KESCHNER.

## SECTION ON NEUROLOGY AND PSYCHIATRY

FOERSTER, R. H.: Anatomical Findings in Syringobulbia. *Monatsschrift für Psychiatrie und Neurologie*, July, 1918, xliv, No. 1.

In the case here described the disease picture was dominated by the bulbar disturbances. The first symptom to make its appearance was a sudden giving way of the left leg. This was followed by an apoplectiform fit, disturbance of speech, difficulty in moving the tongue and in swallowing. The first time the patient was examined by the writer, eight years later, the right half of the tongue showed signs of atrophy, the patellar reflexes were exaggerated, there was Babinski on both sides, and the abdominal reflexes were absent. The author followed the case for a period of ten years, during which the condition of the patient grew slowly but steadily worse. Each new examination revealed an aggravation of the symptoms. There was stiffness and weakness in the legs, with involuntary twitching; bladder disturbances were manifested; the region over the right masseter was sunken; the face was distorted, the chin being drawn to the right. There was extreme atrophy of half of the tongue; the speech was slightly nasal with slurring of consonants; there was sinistroconvex scoliosis, also atrophy in the shoulder region of both sides, and paresis of the arm on the left with absence of tendon reflexes; spastic paralysis of the legs appeared, and anesthesia for temperature and pain, with preservation of sensation to touch, in the left arm, breast, abdomen, and upper thigh; there were abnormal reactions of the cucullaris on both sides. The section revealed syringobulbia with a lateral fissure formation on both sides. On the right, the nuclei of nerves X (sensory and motor), XI, and XII, with the fibers belonging to them, were disturbed. The fibræ arcuatæ internæ were broken through and destroyed; there was corresponding degeneration of the olive of the opposite side. On the left, nerve XI with



its fibers was fully destroyed. Nerves X (sensory) and XII were only partly destroyed; of the *fibræ arcuatæ internæ* only a small dorsal part was interrupted. The fissure formation did not extend to the pons. The clinical symptoms were explained by the post-mortem findings, in the localizations in the medulla oblongata corresponding to the phenomena observed during the life of the patient. The atrophy and impairment of function of the *cucullaris*, as well as the abnormal electrical reaction of the same, was explained by the destruction of the *accessorius* on both sides, the hoarseness by the atrophy of the right laryngeal musculature caused by the affection of the *nervus ambiguus* of the right side. For the atrophy of the *masseter* on the right no anatomical cause could be discovered. It could not be certainly determined to what affection the symptoms of dissociated disturbance of sensibility on the left side, and the motor troubles in the limbs, should be ascribed. They might possibly have been due to disturbances in the medulla oblongata at the level of the nerve-roots. But in the author's opinion it seems probable that the fissure formation, greater on the right side of the medulla oblongata and extending into the *tractus spinothalamicus*, was responsible for the disturbances of sensibility on the left.

S. E. JELLIFFE.

MEDEA, E., AND ROSSI, B.: Injury of the Occipital Lobes with Total Loss of Sight. *Atti della Società lombarda di scienze mediche e biologiche*, 1919, viii, 1.

A clinical account is given of a soldier wounded by a splinter of a shell at the right occipital region two cm. externally to the middle line, almost at the level of the lambdoid suture. The principal symptoms were: partial bilateral blepharoptosis, more accentuated on the right side; paresis of the *musculus rectus inferior* and *externus* of both sides; total loss of sight; very slight bilateral Babinski; slight uncertainty in the movements of the right hand. By means of roentgenography and of the Hirtz compasses it was found that a splinter, of about the size of a bean, had pierced the cranium and after passing through the cerebrum and the *tentorium cerebelli*, had stopped in the *cerebellum* a little to the left of the middle line, at a level remarkably lower than that of the external and cranial wound.

from which it was 9 cm. distant. Two hours after the lesion the splinter was removed, together with some pieces of bone, by following the course of the splinter through the cerebral mass and passing the point of an electromagnet through the hole made by the projectile in the tentorium. Four days afterward the patient began to recognize vaguely the movement of the fingers passed before his eyes, and continued slowly to improve, so that all symptoms disappeared in about four months, except for a total insensibility of the inferior half of the visual field of both sides, *i. e.*, an inferior bilateral scotoma. The neurological interest of the case lies chiefly in the complete functional recovery of the patient after such a serious intervention in a case of double lesion of the cerebrum and the cerebellum. Very likely the blindness of the first days might have spontaneously given place to a partial recovery, but important disturbances of vision would have persisted had not the operation been performed. It is worth noting that the electromagnet was successfully used for this purpose. Besides, and in accordance with experience gained owing to the war and with recent histological investigation, the case supports the opinion according to which the function of vision is localized almost exclusively in the internal surface of the occipital lobe, in the cortex near and surrounding the calcarine fissure.

S. E. JELLIFFE.

SCHAFER, K.: Ueber einige Bahnen des menschlichen Rhombencephalons (Concerning Some Paths in the Human Rhombencephalon). *Zeitschrift für die gesammte Neurologie und Psychiatrie*, March 22, 1919, xlvii, Nos. 1-2, pp. 60-94.

The author seeks to throw some light on certain doubtful or slightly known points in regard to the paths of the fibers in the rhombencephalon by studying injuries of the dorsal region of the pons and cerebellum in cases suited to illustrate the course of the paths and the direction of degeneration, both primary and secondary. In the first case there was a softening in the pons immediately above the point of origin of the trigeminus. The degeneration of the transverse fibers could be followed into the brachia of the pons and from these points it radiated principally to the vermis, leaving the cerebellar hemispheres entirely free from pathological changes. As a result

of the relations revealed in this case the author draws the conclusion that the stratum profundum pontis at the trigeminus level constitutes a path leading to the paleocerebellum and that from this path there are branches to Deiter's nucleus. He proposes the name "ponto-paleocerebellar" to distinguish this path from the "pontoneocerebellar," leading to the hemispheres. The radiation of the fibers of the brachia of the pons to the lower vermis and Deiter's nucleus indicates the possibility that, irrespective of the cerebellar paths, the cerebrum may exert an influence on the medulla oblongata via the pons. The degeneration of the anterior longitudinal fasciculus and of the neighboring predorsal fasciculus were followed into the anterior horns of the superior cervical medulla, and the extreme degeneration of the fasciculus tegmenti centralis to the inferior olivary body. In the olivary body itself, only the central region showed degeneration. The complete immunity of the dorsal region is very striking and significant, indicating that the fasciculus tegmenti centralis is connected only with the ventral olivary region, or rather ends in it. From his second case the author draws conclusions concerning the direction of degeneration in the medial lemniscus, namely, that if there is an injury between origin and ending a secondary degeneration regularly results, both in the central and in the peripheral stump. Three further cases in which there were lesions of the cerebellum are described. In the first there was a focus of softening in the medullary layer about the posterior pole of the nucleus dentatus. In the half of the oblongata contralateral to the focus in the hemisphere there was extreme degeneration in the inferior olive, and a degenerated path connected the two points. In the two other cases there was degeneration in the immediate vicinity of the nucleus dentatus without involving it, and in these instances the olive remained entirely intact, leading to the view that the inferior olive not only has a connection with the cortex of the cerebellum but is closely connected with the nuclei of the cerebellum, especially with the dentatus. The connection between the cerebellum and the inferior olive is thus composed of two parts: (1) a cerebellar path which ends in the cortex of the cerebellum, *i. e.*, in the hemisphere; (2) a cerebello-olivary path springing from the nucleus dentatus and terminating in the ganglion cells of the inferior olive, which may be called a dentato-olivary tract.

S. E. JELLIFFE.



POLLOCK, L. J.: Overlap of So-called Protopathic Sensibility as Seen in peripheral Nerve Lesions. *American Archives of Neurology and Psychiatry*, December, 1919, ii, 667-700.

Pollock maintains that the return of sensibility to pin-prick, which occurs before the return of sensibility to touch, occurs in regions which occupy the areas of nerve overlap, and that this return of sensibility to pin-prick cannot be interpreted as a sign of nerve regeneration. He states that he is supported in this view by the facts that: (1) he has never found a return of sensibility to pain, when sensibility to touch has not returned, except in an area of overlap; that (2) when a nerve is divided and at the same time one or more adjacent nerves are divided, sensation to pin-prick does not return in the area of the overlap of these nerves, even many months following injury; that (3) when a nerve adjacent to one that is severed and which supplied an area of overlap to that nerve is sectioned, the preëxisting sensibility to pin-prick in the overlap area is lost; that (4) when sensibility to pin-prick is present within the anatomic sensory distribution of a severed nerve, resection and suture have no effect upon the general outline of this area of sensibility.

Were it true that the relatively early return of prick pain is due to nerve regeneration, then this return of sensibility should occur not only upon the borders of the sensory distribution of a nerve, but elsewhere, particularly when such borders are more distal from the severed end of that nerve than is some area within the borders. Such is not the case.

If the shrinkage of the area insensitive to pin-prick, responsible for the increase in size of the intermediate zone, or of the area in which pain and extremes of temperature are felt, is a sign of nerve regeneration and not a result of nerve overlap, it should occur whether or not the adjacent nerves are intact. In other words, if the early return of prick pain in a median nerve lesion, which always occurs in the radial portion of the palm, is a sign of nerve regeneration, it should occur whether or not the radial nerve be attacked or severed. This, however, is not the case. When the radial and median nerves are both severed, no return of sensibility to prick pain occurs in this area until sensibility to touch returns. Again, if the return of sensibility to prick pain in the area supplied by the radial nerve is due to a regeneration of that nerve, it should return whether

or not the ulnar and median nerves are intact. This is also not the case, and in combined lesions of the radial, median and ulnar nerves, no return of sensibility to prick pain occurs in this area, even a year following their injury.

It can be definitely stated that when nerves supplying adjoining areas are severed, sensation to pain is at no time present in the border areas, whereas it is uniformly observed when either nerve is divided alone. Furthermore, no sensation to pain returns in such areas in the time given for the beginning of regeneration of protopathic sensibility (forty-three days).

When return of sensation to pain, or presence of sensibility to pain, is found in the area of overlap of an adjacent nerve, analgesia will result if this nerve is severed. In other words, if in a median nerve lesion sensation to pain has returned in the radial portion of the palm and index finger, then if the radial nerve be sectioned, perhaps to be used as a cable transplant, analgesia results in the algesic zone.

If the return of pain sense in the anatomic sensory distribution of a nerve is due to regeneration, then subsequent resection and suture of this nerve should again produce an analgesia in this area. This is not the case, and, when sensibility to pain is present in an area of overlap, although some change in the outline of this area occurs, the area is in general unchanged by resection and suture.

S. E. JELLIFFE.

UNGER, E.: Elektrische Reizungen am freigelegten menschlichen Nerven (Electrical Stimulation of Exposed Nerves in Man). *Neurologisches Centralblatt*, Feb. 2, 1919, xxxviii, No. 3, pp. 82-88.

The author made a series of observations concerning the stimulation of sound and injured nerves during operations, and when patients were under local anesthesia, with the following results: the faradic current produces only pricking and jerking; the galvanic current, a feeling of heat, which grows in intensity, and of cold, which diminishes in intensity; but the feeling of cold only arises as a cessation of heat, not as a positive sensation; the faradic and galvanic currents, if applied simultaneously, produce a feeling of

pressure. The author was able to verify in human beings the fact that if a galvanic current is passed through a nerve, a zone is created in the vicinity of the cathode which is very sensitive to a faradic electrode. Around the anode, on the other hand, there is a zone which is only slightly sensitive. It has been stated that a sensation of heat is produced by injections of fluids in exposed nerves. On the ground of his experiments the writer confirms this for the medianus, ulnaris, tibialis and peroneus. In the facialis the patient felt no sensation. Experiments were undertaken to determine the results of stimulation of the vasomotor nerves. In a patient with injury of the sciatic nerve, the scar was stimulated with a strong current without producing the least motor effect. Suddenly sweat made its appearance on the outer edge and back of the foot. The patient felt no sensation of heat. It is to be assumed that the motor fibers were totally destroyed, the sensory fibers severely injured, while the secretory fibers could still be set in activity by a strong current. This would indicate that the secretory fibers could only be affected by very strong currents and that vasomotor effects are not observed in other cases, because the current which is strong enough to produce them causes extreme motor twitching. Experiments with electrical currents under local anesthesia are useful in determining how far, in nerve injuries, a cicatrice must be excised to reach the healthy tissue. First, the part that is certainly unhealthy is removed, then cross section after cross section until the electrode reaches fibers the stimulation of which causes adequate sensation.

S. E. JELLIFFE.

BYCHOWSKI, Z.: Über eine künstliche Umschaltung des Babinskischen Zehenphänomens (Concerning an Artificial Reversal of the Babinski Sign). *Neurologisches Centralblatt*, Jan. 2. 1919, xxxviii, No. 1, p. 11.

In examining soldiers with injuries of the medulla oblongata, the author observed the following phenomenon: If the patient who showed a positive Babinski was told to lie on his abdomen and the attempt was made to elicit the Babinski, the knee of the leg being bent at right angles, the result was often a flexion of the great toe instead of an extension of the same, and often no motor effect at



all was produced. Later the author was convinced that there was also a reversal of the Babinski where there was brain injury, for when he began again to treat patients in civil life, he observed this same phenomenon in some patients with disease of the brain and medulla. This reversal is observed in probably about one-third of the cases of positive Babinski. In cases with bilateral positive Babinski, the author was at times able to demonstrate the reversal only on one side.

In the same case, the phenomenon does not always succeed with the same distinctness. The first time the author beheld the phenomenon he thought his eyes deceived him, but later experiments proved that there was really a flexion. That the phenomenon depended upon no purely mechanical movement was proved by the fact that the reversal could be produced when the leg was in various positions, and also when the knee was extended and the foot slightly flexed. The essential circumstance is that the patient should lie on his abdomen on the bed, and the best position for obtaining the reversal is with bended knee. Neither the intensity of the fundamental disease nor the degree of extension of the great toe when the patient is lying on his back seems to influence the result. The author has observed this flexion of the great toe in severe traumatic myelitides and hemiplegias. He is unable, however, to offer any satisfactory explanation of the phenomenon.

S. E. JELLIFFE.

GALANT, S.: Eigentümlichkeit einer Myoklonusepilepsie (Peculiarities of a Myoclonic Epilepsy). *Neurologisches Centralblatt*, Dec. 1, 1918, xxxvii, No. 23, pp. 782-4.

Among the numerous epilepsies which have been described, myoclonic epilepsy (Unverricht-Lundborg) deserves special attention. This form was described by Bechterew as *epilepsia chronica*, and by Bresler as spinal epilepsy, but finally the name myoclonic epilepsy was generally attached to it. Nearly every case of this disease presents some new features and, therefore, it is much to be desired that descriptions of all cases observed should be published. It is remarkable that this form of epilepsy is nearly always a familial disease, the other members of the family also suffering from myoclonic

epilepsy or simply from myoclonia (an affection characterized by myoclonic twitching, without epileptic attacks, is called paramyoclonus multiplex—Lewandowsky).

The author's patient was a man thirty years old, robust in appearance, at times able to work. A characteristic of this case was a severe disturbance of equilibrium, which made its appearance at times. Pronounced epileptic attacks were somewhat rare, occurring only once or twice a year, but, on the other hand, the patient frequently lost consciousness, and this usually occurred when he was addressed unexpectedly or when, in walking, he made a turn, or if he became suddenly excited. Under these circumstances he fell down suddenly, and it is peculiar that he always fell on the same part of his body, hitting his left eyebrow so that it was always black and blue and swollen. The author notes that this tendency to fall in the same position is characteristic of epileptic attacks, and in the same patient the various attacks resemble each other so much that they might be taken for two examples of the same photograph. The disturbances of equilibrium seemed not to be the result of a disease of the labyrinth, but rather due to an affection of the cerebellum. The myoclonic twitching extended to the musculature of the entire body, but only in severe attacks were the muscles of both sides of the body affected at the same time. The patient's speech was jerky, as in arteriosclerosis, because of the twitching of the muscles of the larynx and tongue. Especially severe attacks of myoclonic twitching were caused by sexual excitement. It may be added that the patient used alcohol for a time, and that his father was a hard drinker.

S. E. JELLIFFE.

WECHSLER, I. S.: Hysteria Simulating Brain Tumor. *New York Medical Journal*, November 22, 1919, cx, No. 21, p. 844.

The great rarity with which hysteria simulates brain tumor by giving a clinical picture of actual anatomic involvement, corresponding to strict cerebral localization, prompts Wechsler to report the following case in more or less detail:

The patient was twenty-three years old, single, female, a stenographer by occupation. She was first seen by the author at her

home on January 5, 1919. Her chief complaint was that she suffered from spells, lasting from a few seconds to one minute, during which she lost all power of speech and experienced weakness in the right hand and arm. The condition had come on suddenly, December 10, 1918, and had grown progressively worse. The first symptom was vertigo, which was aggravated on looking to the right. She was nauseated but did not vomit, and did not fall or stagger to either side. At the same time a constant and severe frontotemporal headache also set in. This condition lasted two weeks, when both the headache and vertigo ceased. On December 26 she went to bed, and while speaking to somebody, suddenly found herself unable to move her tongue or utter a word, although she knew what she wanted to say and understood everything that was spoken to her. This lasted a few seconds and passed off. Since then these temporary losses of ability to speak had come on more frequently and several times a day. On January 2, 1919, she noticed a gradual weakness of the right upper extremity, more particularly of the hand. She became drowsy and slept a good deal.

Aside from an operation for a congenital right internal strabismus, in 1913, the ordinary diseases of childhood, and an attack of influenza in October, 1918, there was nothing noteworthy in her previous history.

Her habits were good; her appetite was fair, and she slept excessively. Her bowels were regular; there was no loss of weight, and no urinary disturbances. Her menses began at fourteen and a half, and were normal. Her last period came on January 5, 1919. She denied masturbation and laid claim to little sexual desire. She had a number of boy and girl friends, and had always been sociable. She never had double vision, auditory disturbances, pains, cough, or dyspnea. She had no phobias or obsessions, and was not subject to emotional disturbances, although she worried a good deal over her present condition. Her memory was good. She denied having had sexual relations.

Her father died of hepatic disease; otherwise her family history was negative in every respect. She lived at home with her mother and stepfather, with whom she got along well, although they were not on intimate terms.

The only positive findings on careful examination were a slight right apraxia (inability to carry out skilled acts), interference with



the handwriting, slight diminution of strength in the right hand, and concentric contraction of the visual fields. Aside from the contracted visual fields there were no other physical stigmata of hysteria. In spite of the absence of choked disc, projectile vomiting, etc., and of the presence of contraction of the visual fields, the author was inclined to make a tentative diagnosis of beginning subcortical brain tumor involving the third left frontal convolution and the adjoining arm area. Hysteria was considered for a moment, but quickly dismissed.

Six days later the patient returned with the following additional history: The "spells" have increased in frequency. Weakness of the right hand is more marked, especially if she attempts to use it. She feels sleepy all the time and yawns a good deal. Her mother noticed twitching of the right fingers during the "spells." On two or three occasions the whole body shook and became stiff for a few minutes. She feels "dopey" and complains of a bitter taste in the back of the tongue. She has sharp pains in the left side of the head, the eye, and back of the head. During the "spells" she has great difficulty in picking up things, such as hairpins, combs or buttons. There was no change on physical examination.

The diagnosis of cerebral neoplasm at this time became fairly certain. It seemed that a right hemiplegia was developing, as it does if there is something growing in the left motor cortex or sub-cortex, beginning with an aphasia.

*January 8, 1919.*—The "spells" are just as frequent. During the attacks the patient cannot walk, but totters, without, however, dragging the right leg. She has no headache and does not vomit, but complains of pains in the left side of the head. She also claims that her sleep is more disturbed than usual, and that she has no sense of direction in either hand during the "spells." Her physical condition is unchanged.

*February 2, 1919.*—The attacks are more frequent and of longer duration, during which the patient must hold on to something lest she should fall; the legs are stiff and feel heavy.

On Feb. 25, 1919, she was examined by an eminent neurologist, who concurred in the diagnosis of brain tumor and advised a consultation with a brain surgeon. On March 3 this was done, and the unanimous decision was: brain tumor. But operation was deferred for the time being.

After this Wechsler did not see the patient until May 3, when she walked into his office with the glad news that she had been to another physician, who had given her some herbs, after which she was completely cured. Physical examination at this time was negative.

"Obviously," says the author, "our diagnosis had to be altered, although the *amour propre* hung on tenaciously to the hope (?) of a remission." On July 19 she returned, stating that she had been at work for two weeks, but had to give it up, because she did not feel well and could not concentrate. The "spells" had disappeared for good, but she felt "just miserable" and could not apply herself to anything. At this time, Weschler seriously began to entertain the idea of hysteria, and a little delving beneath the surface brought out the following information:

When she was seven, a six year old cousin of hers attempted sexual intercourse with her. She had forgotten all about this, but one day while she was riding with her father in a car, he made the casual remark, "we will have to find out about it," and he looked at her, or at least she thought so. At once the idea flashed through her mind that her father knew of her experience, and wanted to find out whether she was a virgin. Since then this thought has kept on torturing her. She visualizes terrible consequences should the prospective husband find out about her "defloration." She was greatly attached to her father, who died when she was sixteen. She is also attached to her youngest brother (incest complex). She wants affection but does not get it. There is no sympathy between her and her mother. She has periods of sexual desire when she is very miserable. She recalls very vividly having witnessed, at the age of eight, a sexual episode between her parents, which left an indelible imprint on her mind. After the partial unravelling of these conflicts the author referred the patient to a psychoanalyst for further exploration (and the abstractor hopes a lasting cure will finally be brought about).

M. KESCHNER.

HERSHBERG, H.: Lethargic Encephalitis. *New York Medical Journal*, Nov. 29, 1919, cx, 899.

Hershberg reports the case of a soldier twenty-two years of age who was admitted to Base Hospital No. 69, Savenay, France, on Jan. 6, 1919, complaining of marked drowsiness, constant tendency to sleep, double vision, and general malaise. His present illness began thirteen days before admission with dizziness, headache, fever and diplopia; a few days later he became drowsy and almost stuporous. He was markedly constipated, heard a buzzing sound in his head, was chilly in the morning and feverish at night, had difficulty in urinating, especially in starting the stream.

*Jan. 10.*—Marked facial weakness on right side; weakness in drawing up right corner of the mouth, closing right eyelid and wrinkling right forehead; quivering about the right side of mouth; deviation of uvula to the right. No other signs.

*Jan. 11.*—V. Right 20 V. Left 20. Right pupil larger than left.

$\overline{50}$                        $\overline{30}$

Both react to light and accommodation and consensually. Nystagmus on looking to left. Fleeting diplopia. Fundi normal. The otolaryngological examination showed a normal larynx, and the uvula deviated to the right. Right side of nose completely obstructed by deviated septum pressing against middle turbinate. No pus in nose or throat. Ear drums slightly retracted.

*Cerebrospinal Fluid.*—Twenty c.c. clear fluid drawn off, under slightly increased pressure; globulin 0; 5 cells; no growth; smear shows no bacteria; Wassermann negative.

*Blood, Jan. 7.*—No plasmodia. Erythrocytes 4, 810, 000. White cells 11, 800; polynuclears 62; small mononuclears 35; transitional 3.

*Jan. 16.*—White cells increased to 15, 600; small mononuclears 18; large mononuclears 3; polynuclears 79. Blood Wassermann positive.

*Urine.*—Negative on several examinations.

*X-ray.*—An x-ray of the skull was negative.

*Temperature.*—The temperature ranged from 98° and 100.6° F. (36.67° and 38.11° C.) in the morning to 99.8° and 100.8° F. (37.66° and 38.22° C.) in the evening.

Ten days after admission the right facial palsy was much more marked; the patient could be aroused with difficulty from his drowsi-



ness; the right pupil was slightly larger than the left; there was evidence of left sixth nerve involvement.

Twenty-five days after admission the upper facial group of muscles were parietic; the patient could not close his right eye completely, nor did the occipitofrontalis or orbicularis palpebrarum contract well. The left side of the face was weak. The left eyelids did not entirely approximate; the patient could not frown nor wrinkle his forehead.

One month after admission the forehead wrinkled normally. When the patient showed his teeth both sides of the face appeared equal; the drowsiness disappeared. The patient could get out of bed and walked about without difficulty. By the end of February he was discharged from the hospital perfectly cured.

The absence of eye-ground changes and the presence of fever, with the nature of the onset of the disease, involvement of the facial muscles, the diplopia (fleeting), nystagmus, marked drowsiness, partial involvement of the left sixth nerve with improvement and disappearance of all signs and symptoms, leads the author to believe that in all probability the patient was suffering from lethargic encephalitis.

M. KESCHNER.

FELL, E. W.: Psychoses Accompanying Influenza: Clinical Features and Prognosis. *Boston Medical and Surgical Journal*. Jan. 29, 1920, pp. 113-116.

Influenza may precipitate an impending psychosis (as paresis), or it may add new features (usually an element of confusion) to an existing psychosis, or hasten its progress.

The psychoses which bear a close relation to the influenzal attack may come on during the fever or during convalescence. They fall into three groups:

(1) The manic-depressive, which show a marked predisposition, are most often of the depressed type. In these, schizophrenic features may develop and persist.

(2) The exhaustive-infective group may include cases of simple hallucinatory confusion and run a short course, or they may have

precox features, the delirium schizophrenoides of Menninger. Heredity and predisposition are not evident in this group.

(3) In the dementia precox group, the cases may be clearly such from the beginning, or the precox features may develop in either of the other two groups. When fully developed, they usually have the depressed hebephrenic picture. Dementia precox constitutes one-third of the influenzal psychoses.

Individual cases in any of these three groups may present quite typical clinical features, but there is often an intermingling of schizophrenic features in the manic-depressive and infective groups, so that taken as a whole a series of cases will present an overlapping gradation from a simple neurasthenic depression to a rapidly deteriorating hebephrenic precox.

The prognosis as to duration in the manic-depressive cases is thought to be better on the average than in such psychoses coming on without apparent, adequate, exciting cause. The exhaustive-infective cases of simple type run quite a short course and do not tend to relapse. Those cases which have precox features are quite uncertain as to their course, and care should be exercised in giving a prognosis. The dementia precox cases seem to run a more rapid course than usual, but here again, especially in those beginning abruptly with deliria, recovery often occurs quite unexpectedly, and until the disease is fully developed opinion as to the outcome should be guarded.

S. E. JELLIFFE.

ORDWAY, M. D.: Report of Neurological Sequelæ of Influenza in the Boston City Hospital Neurological Out-patient Department, from July, 1918, to July, 1919. *Boston Medical and Surgical Journal*, Feb. 19, 1920, clxxxii, No. 8, p. 194.

Many neurological conditions were diagnosed as "postinfluenzal." Thirty-one cases were followed, and although the relationship to influenza may be questioned, it is justifiable to consider influenza a predisposing, exciting, or essential cause of the condition until it is

proved not to be so. While the condition cannot be accurately classified the following tentative classification is made:

- I. Exhaustion (11 cases).
  - (1) Debility or fatigue cases.
  - (2) Psychoneuroses.
    - (a) Neurasthenic type.
    - (b) Psychasthenic type.
- II. Neuroses (7 cases).
  - (1) Occupational type (1 case).
  - (2) Chorea (6 cases).
- III. Neuritis (2 cases).
  - (1) Double ulnar (single nerve type).
  - (2) Multiple.
- IV. Encephalitis (2 cases).
- V. Hemiplegia (4 cases).
- VI. Undetermined relationship (5 cases).
  - (1) Transverse myelitis (2 cases).
  - (2) Paralysis agitans (1 case).
  - (3) Progressive muscular atrophy (1 case).
  - (4) Postinfluenzal athetosis (1 case).

In the first group the ages were from twenty-two to fifty-one; 9 were women, 2 men. These cases showed a tendency to relapse on exertion, after periods of improvement. In the debility cases mild depression and restlessness were present. There was tremor of the hand in 2 cases and of the eyelid in 1. Two had severe neuralgia (1 temporal, 1 frontal).

In the second (neuroses) group, occupation seemed to play a part in the localization in one case. The symptoms were numbness, pin and needle feelings, lifelessness of the left arm with objective slight weakness of grasp and flexion and extension of the hand. Six were chorea cases: 5 school children and 1 boy of sixteen. None had chorea previous to the influenza and all had been in perfect health. Five of the 6 were completely relieved, but one developed asthma.

In group three (neuritis) 2 developed neuritis closely resembling diphtheritic neuritis. One case, which was diagnosed as a multiple neuritis, was that of a man of forty-eight who had had a mild attack of influenza lasting only five days. Following this, numbness



appeared in the tips of the toes and fingers, and spread to above the elbows and knees. The power of coördination was lost. In the right ear there was a roaring sound, and partial deafness. Sensation to touch was partially gone in the hands and feet. Physically the patient showed loss of knee-jerks and marked Romberg, but was normal otherwise. The serology was negative. The gait was staggering. The pain and temperature senses were normal. After six months' treatment he made a good recovery with restoration of the knee-jerks.

The other case was of a boy of fifteen who complained of paralysis of both little fingers. He had had diphtheria eight years before, with good recovery. He had had influenza in August, 1918, and one month later both little fingers became numb; later there was pain radiating up the ulnar side of the forearm to the elbows. The pain and touch sensations were diminished, and limited to the ulnar distribution of both hands. The condition improved under treatment.

Two cases of encephalitis developed two months after influenza. Both patients had dizzy spells. One showed unequal pupils, left Babinski, stupor, loss of sexual power, mild optic neuritis. The other had left peripheral facial paralysis, unsteadiness, lateral nystagmus, mild optic neuritis, left Oppenheim and Babinski, and transitory twitching of the right hand. At the end of the year the twitchings and Babinski were still present, but both cases were practically well and restored to activity.

In the 4 hemiplegia cases the ages ranged from seventeen to sixty. All were well before the severe attack of influenza occurred. Wassermann, urine, and blood-pressure were negative in all. One had paralysis of the face, arm, leg, right side, and a speech disturbance, which cleared up. The seventeen-year-old boy had increased elbow-, knee-, wrist-, and ankle-jerks, ankle clonus, Babinski on the left side, loss of muscle sense; the pain and touch sensations were diminished on the left. Ten days later the Babinski and ankle clonus disappeared. The sixty-year-old man was a heavy drinker; the findings were negative the blood-pressure was 135 systolic and 65 diastolic. Three weeks after the influenza attack the patient was unconscious for three days. The right hand was weak; he could not talk; there was loss of vision of the right eye. The right pupil was larger than the left and sluggish to light. Babinski and clonus were present on the right side; the right arm and wrist reflexes were hyperactive;

the tongue was deviating to the right and tremulous; there was impairment of the right facial muscles. A few months later the right hand became spastic and there was difficulty in movement of the shoulder girdle, but speech was normal, sight normal, and the patient was generally improved.

In the last group influenza was either a coincidence or a precipitating factor, with the exception of a case of postinfluenzal atetosis, which more properly belongs to the encephalitis group.

The conclusion is that even extreme organic involvement of the central nervous system following influenza has a better prognosis, in the majority of cases, than similar conditions unassociated with this disease.

M. M. BANOWITCH.

## "ENCEPHALITIS LETHARGICA"

A COLLECTED ABSTRACT

By SMITH ELY JELLIFFE, M. D., Ph.D.

(Continued from page 101)

*Distribution of Cases.*—With these notes on the historical aspects we turn to the development of the present situation.

V. Economo's original study of the Vienna cases stated the matter in its present form.

In the discussion of v. Economo's paper before the Wiener Verein für Neurologie und Psychiatrie, held April 17, 1917, Schlesinger reported 2 cases and Redlich 5. The latter studied these subsequently with another case, and gave a thorough presentation of the matter under the title of "Encephalitis cerebelli et pontis."<sup>1</sup> At a later discussion Redlich brought forward the hypophyseal hypothesis concerning the lethargy, to which attention will later be directed. Rozankowsky later reported Vienna cases, and with the gradual accession of European reports we learn that the epidemic appearance of these and related types of syndromes was fairly widespread.

<sup>1</sup>Wien. klin. Wchnschr., 1918, xxxi, 629.

German epidemics began to be reported. Reinhart had cases in Kiel. Runge, Stern and Siemerling, and later Speidel, Naef, v. Sohlern and Groebels, reported cases in Munich.<sup>2</sup>

All of these authors expressed the opinion that the encephalitis lethargica of v. Economo was not distinguishable from influenza encephalitis. Nonne also reported cases from Hamburg districts.

The French cases soon began to multiply. Chauffard and Bernard, Souques, Lesné, Sainton, Khoury, Lhermitte, Lhermitte et Saint-Martin, Netter, Claude, Morax, Etienne, Claisse, Audibert, Lortat-Jacob et Hallez, Claude et Schaeffer, Marie, Marinesco, and others, reported cases in divers parts of the country during 1917, 1918 and 1919; Paris, Rouen, Havre, Nancy, Berny, Lille, Laval, Lyons, Marseilles, and other localities gave their quota of cases.<sup>3</sup>

Both the British and American Expeditionary soldiers, while they were in France, paid their toll to epidemic encephalitis.

<sup>2</sup>SPEIDEL: *München. med. Wchnschr.*, 1919, lxvi, 958.

NAEF: *München. med. Wchnschr.*, 1919, lxvi, 1019.

V. SOHLERN: *München. med. Wchnschr.*, 1919, lxiv, 1091.

GROEBELS: *München. med. Wchnschr.*, 1920, lxvii, 131.

NONNE: *Neurol. Zentralbl.*, 1919, xxxviii, No. 21.

KRAMER UND HENNEBERG: *Berl. klin. Wchnschr.*, 1917, liv, 219.

LICEN: *Ztschr. f. d. ges. Neurol. u. Psychiat.*, 1918, xliii, 1.

SCHROEDER: *Monatschr. f. Psychiat. u. Neurol.*, 1918, xliii, 146.

<sup>3</sup>AUDIBERT: *Marseille méd.*, 1919, lvi, 337.

BURGER: *Arch. d' Opht.*, 1918, xxxvi, 356.

CHARTIER: *Presse méd.*, 1918, xxvi, 660.

CHAUFFARD ET BERNARD: *Bull. et mém. Soc. d. hôp. de Paris*, 1918, xlii, 330, 470.

CHAUFFARD: *Rev. gén. de clin. et de thérap.*, 1918, xxxii, 577.

CLAISSE: *Bull. et mém. Soc. d. hôp. de Paris*, 1919, xlii, 364, 521.

CLAUDE: *Bull. et mém. Soc. d. hôp. de Par.*, 1919, xlii, 364, 521.

CREYX: *Jour. de méd. de Bordeaux*, 1918, xlviii, 62.

ETIENNE: *Bull. et mém. Soc. d. hôp. de Paris*, 1919, xliii, 482.

KHOUBY: *Soc. méd. hôp.*, May 17, 1918.

LESNE: *Soc. méd. hôp.*, April 12, 1918.

LHERMITTE: *Annales de méd.*, 1919, vi, 306.

LORTAT-JACOB ET HALLEZ: *Bull. et mém. Soc. d. hôp. de Paris*, 1918, xlii, 439.

MARIE ET TRETIAKOFF: *Bull. et mém. Soc. d. hôp. de Paris*, 1918, xlii, 439.

MAURIAC: *Paris méd.*, 1918, xxix, 326.

MILIAN: *Bull. et mém. Soc. d. hôp. de Paris*, 1919, xliii, 225.

NETTER: *Bull. et mém. Soc. d. hôp. de Paris*, 1918, xlii, 307, 384.

— *Bull. Acad. de méd.*, 1918, lxxix, 337.

— *Paris méd.*, 1918, xxix, 81.

NETTER ET SAINTON: *Presse méd.*, 1918, xxvi, 487.

OLIVER: *Marseille méd.*, 1919, lvi, 554.

SAINT MARTIN ET LHERMITTE: *Prog. méd.*, 1918, xxxiii, 213.

— *Paris méd.*, 1918, xxix, 64.

— *Bull. et mém. Soc. d. hôp. de Paris*, 1918, xlii, 457.

SAINTON: *Bull. et mém. Soc. d. hôp. de Paris*, 1918, xlii, 424, 543.

SOUQUES: *Bull. et mém. Soc. méd. d. hôp. de Paris*, April 19, 1918.

DE VERBIZIER: *Paris méd.*, 1918, xxviii, suppl. 345.



Brasher, Caldwell and Coombe<sup>4</sup> record two cases of encephalitis lethargica, occurring in young adults and following immediately upon an attack of influenza complicated with pneumonia. In the spinal fluid of each patient an organism was found which appeared to be identical morphologically with that which was found by Bradford in the blood, sputum, pleural fluid, and spinal fluid in cases of influenza, trench fever and nephritis among the British troops in France. The organism was a minute, Gram-positive coccus, which was chiefly extracellular and which failed to grow aërobically on the usual media. It is suggested that this organism was the cause of the encephalitis in these two cases.

Skversky,<sup>5</sup> in an excellent study, has portrayed the American soldier's contribution to this situation. He shows how encephalitis may occur as a complication in any acute infection. With encephalitis, an elastic term, diffuse brain involvement is expected, and the naturally outstanding feature of lethargy. In 9 of the 10 cases described there was a definite febrile period, either preceding or concomitant, including bad colds, mumps, some form of bronchopneumonia, and, in 1 case, a possible paratyphoid B. There was eosinophilia in the blood and a lymphocytic spinal fluid in most cases; the bacteriological examinations proved negative. While the majority of these cases resembled other well-known diseases of the central nervous system, they were atypical in some form, either in onset, clinical course, or outcome; but clinically they represented encephalitis with lethargy. The study of these cases, while one must bear in mind the possibility of their being instances of distinct infectious diseases of the nervous system, which may escape detection because of a general similarity in their clinical manifestations to well-recognized entities, does not aid in establishing lethargic encephalitis as a definite clinical entity.

Cleland and Campbell<sup>6</sup> had reported cases in Australia in an epidemic of 1917, although they held that these were to be distinguished from v. Economo's group.

\*BRASHER, J., CALDWELL, J. R., AND COOMB, E. J.: *Brit. Med. Jour.*, June 14, 1919.

\*SKVERSKY, A.: Lethargic encephalitis in the A. E. F., *Amer. Jour. Med. Sc.*, Dec., 1919.

\*CLELAND, J. B., AND CAMPBELL, A. W.: Acute encephalomyelitis. *Med. Jour. Australia*, March 22, 1919, 1, 234.

They believe that the acute encephalomyelitis under discussion is a distinct and hitherto unrecognized entity resembling ordinary infantile paralysis, and at the same time histologically resembling hydrophobia. The disease is always present in sporadic form. Investigations carried out during 1918 by Cleland, Campbell and others, seem to give strong support to the contention that the disease is a hitherto unrecognized entity. The authors call special attention to the following points: There is no record of an epidemic of acute poliomyelitis in which signs of cerebral irritation have so strikingly dominated the clinical course, nor of one in which there has been such a high mortality rate (70 per cent), nor of one in which such a large proportion of adults have fallen victims. Histologic examinations of the brain and spinal cord from 16 human cases and from various experimentally infected animals have all shown lesions of a similar and, as regards distribution, distinct kind. The first and most important change is a thickening of the veins. The vein wall is surrounded by a collar or sheath or sleeve of cells, which sometimes fills and distends the perivenous space. The vessels so affected may be found, apparently, in any part of the brain or spinal cord, although not necessarily in the same site in all cases. Some vessels may be affected and others escape. In early cases most of these cells are indistinguishable from lymphocytes, although interspersed among them may be some cells of fixed connective tissue origin. Later the cells may show more protoplasm and an indented nucleus—a stage toward organization. In addition to these perivenous sheaths, there is intense congestion of all vessels and sometimes evidence of stasis. As secondary phenomena degeneration of nerve-cells may occasionally be found, probably due to interference with their nutritive supply. The disease in monkeys, of which the authors have had 20 examples under observation, seems not to agree with that described in these animals when infected with the virus of ordinary infantile paralysis. Altogether 19 of the 20 monkeys showed varying degrees of incoordination, and 13, including 12 of the 19, exaggerated muscular movements or convulsions. On the other hand, 14 monkeys showed paresis or paralysis, consisting of slight paresis of a limb in 3 cases, marked paresis in 5 and apparent paralysis of a limb or other part in 6 cases. In 2 monkeys ptosis was marked and in 1 it was slight. Two showed squint. In no instance was the disease ushered in by definite paresis or paralysis of a limb or set of muscles alone, and in no

instance was paresis or paralysis the dominant clinical feature. The virus of the Australian disease has been conveyed to 13 sheep, a calf, and a yearling foal. A histologic examination of the brains of these animals has shown the same pronounced perivenous cellular infiltration as was seen in the human cases and in monkeys.

Breinel,<sup>7</sup> and Mathewson and Latham<sup>8</sup> also reported cases from Australia.

English cases now began to be reported. In the beginning they were chiefly called "botulism" but soon the error of this classification was pointed out. In fact the slightest historical knowledge should have given the *coup de grâce* to this interpretation. It must not be forgotten, however, that war conditions had so seriously disturbed the canning industries of the world that it is not impossible that some botulism cases may, after all, have occurred, and have been among those reported. The recent fairly widespread occurrence of severe botulism poisoning from canned ripe olives in the United States is one of the bits of evidence upholding this possibility. Also, Salomonson reported botulism in Holland, whether or not incorrectly is not yet known.

The English reports<sup>9</sup> came from all over the country. Cases were reported by Batten and Still, Harris, Hall, Smith and Parkes,

<sup>7</sup>BREINEL: *Med. Jour. Australia*, March 16, 1918.

<sup>8</sup>MATHEWSON AND LATHAM: *Med. Jour. Australia*, 1917, II, 352.

<sup>9</sup>BATTEN AND STILL: *Lancet*, 1918, I, 636.

BRASHER AND CALDWELL: *Brit. Med. Jour.*, 1919, I, 733.

BUZZARD: *Lancet*, 1918, I, 715; II, 835.

DODSON: *Lancet*, 1918, I, 615.

DRAPER: *Local Govt. Board Report*, 1918.

HALL: *Lancet*, 1918, I, 568.

———: *Brit. Med. Jour.*, 1918, II, 461.

HARRIS: *Lancet*, 1918, I, 568.

———: *Practitioner*, 1918, cII, 39.

LOWE: *Guy's Hosp. Gaz.*, 1918, xxxII, 223.

MARCHALL: *Brit. Med. Jour.*, 1918, II, 8.

MELLAND: *Brit. Med. Jour.*, May 18, 1918, I, 25.

MORAX: *Brit. Jour. Ophth.*, 1918, II, 529.

MOTT: *Proc. Roy. Soc.*, 1918, xII, Med. I, 23.

PHANTON: *Proc. Roy. Soc.*, 1918, xI, Med. Sec., I, 27.

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O'CARROLL AND NESBITT: *Dublin Jour. Med. Sc.*, 1919, cxlvII, 206.

PICKEN: *Med. Officer*, 1918, xI, 37.

RICE-ONLEY: *Lancet*, 1918, II, 15.

RUSSELL: *Lancet*, 1918, II, 106.

SMITH, J. A.: *Lancet*, 1918, I, 737.

VAIDYA, S. K.: *Lancet*, 1918, II, 91.

WILSON: *Lancet*, 1918, II, 7-91.



Weber and Park, Vaidya and Bombay, Chalmers, Picken and Maclean [Glasgow] and many others. Kinnier Wilson cleared up all of these cases with much skill and directness.

Finally James<sup>10</sup> made an epidemiological investigation of the distribution of this epidemic disease throughout England, in the hope of throwing some light upon its cause, or its relation to other diseases, chiefly to poliomyelitis. The observations indicated that the disease was widely, but very sparsely, distributed through the country generally, that cases occurred in localities in which there were no cases of true poliomyelitis at the time, and that cases have occurred where true poliomyelitis was present, but rare. It seemed evident, therefore, that this particular epidemic showing the syndrome of lethargic encephalitis was not an epidemic form of acute poliomyelitis, but that there was a relation to influenza, although this was not yet clearly settled.

Case reports from Switzerland came later. Cramer<sup>11</sup> found the disease in Geneva. He views the subject partly from an historical point of view. He traces the disease backward without difficulty to 1712, when it was known even in Switzerland as the sleeping sickness. In 1890 it was known as *nona* [some use the term *noma*], grippal coma, grippal hypnosis. To-day we term it encephalitis lethargica. In 1712 Camerarius described the Tübingen epidemic under the term: sleeping sickness, and those who read the account to-day can readily comprehend that it agrees in essentials with the malady of 1890 and of 1917-19. Between 1712 and 1890 there is little literature to be found on the subject. The epidemic of 1890 was associated with untreated grip, the condition appearing as a sequela which is largely preventable. Some victims suggested men in alcoholic debauch. The reappearance of the disease one year before the pandemic of 1918 tends to invert the belief that it came in the wake of influenza. In addition, it was transmissible to the monkey, which it destroyed in forty-eight hours. Cramer points out that, in Switzerland, it both preceded and followed the latest pandemic of grip. In Vienna, where a new epidemic of the enceph-

<sup>10</sup>JAMES, S. P.: The distribution of lethargic encephalitis. *Lancet*, Dec. 21, 1918.

<sup>11</sup>*Rev. méd. de la Suisse Romande*, May 20, 1919.

alitis began in 1917, the disease occurred only in the cold months, when local grip was also flourishing.

Müller-Bergalone<sup>12</sup> gives a very thorough account of a case in Switzerland. It was necessary to exclude all other forms of encephalitis, and there was little difficulty in ruling out: metastatic encephalitis from malignant endocarditis associated with embolism of cerebral arteries; metastatic encephalitis from some acute infectious disease, anthrax being thought of, in which capillary embolism from bacteria figures; encephalitis by direct propagation from some extracranial focus; encephalitis beginning as purulent meningitis; hemorrhagic encephalitis from the thrombophlebitis; and grippal encephalitis. In every one of these encephalitides the process is a secondary one, the inflammation is of the polynuclear type and hemorrhagic in character, and there is no typical site. The process of exclusion does not end here. Chronic encephalitis, of which the only known types are syphilitic or due to trypanosomes, may be ruled out. There remains the polio-encephalitic form of the Heine-Medin disease, and here the parallel is quite close and immunity of the spine is the only differentiating factor. Lethargic encephalitis has spared the spine, but so far as the type of encephalitis is concerned it is the same in both conditions, even in the histological picture. Had there been infantile paralysis in the vicinity, differentiation would have been impossible.

Juarros<sup>13</sup> reports the first 2 cases of lethargic encephalitis to be published in Spain. One was of such a fulminating type that it proved fatal in less than twenty-four hours from the first signs of delirium, followed by bilateral ptosis and coma, but there had been slight fever and symptoms of catarrhal gastro-intestinal disturbance for four days. The other patient was a young woman; the disease began with a slight chill and mild fever, improving in three days; on the fourth day somnolency developed, with slow pulse, dilatation of the pupil, absence of pupil reaction to light or accommodation, and abolition of other reflexes, fibrillary tremor of lips and tongue, but absence of Kernig sign. By the seventh day the temperature was high, with trismus and absolute coma. The ninth day the temperature reached 42.5° C. (108.5° F.) just before death. There were

<sup>12</sup>MÜLLER-BERGALONE: *Cor.-Bl. f. Schweiz. Aerzte*, Nov. 6, 1919, xlix, 45.

<sup>13</sup>JUARROS, C.: Lethargic encephalitis. *Plus Ultra*, II, No. 8.

no convulsions at any time, no anuria, the blood-pressure was not high, and there was no history of kidney disease. Juarros describes these cases as probable examples of lethargic encephalitis.

From Spain the transit to Algiers was not difficult,<sup>14</sup> and some cases have come from Johannesburg.<sup>15</sup>

In Italy case reports are coming in somewhat later. Venice, Milan, Bologna, Salerno, Genoa, Pavia,<sup>16</sup> and other Italian cities, report cases.

Three cases of encephalitis from Uruguay are recorded by Morquio.<sup>17</sup> The disorder suddenly began with headache, fever, convulsions and unconsciousness, the stupor persisting till death, which occurred on the fifth and twenty-third days, respectively, in the case of two girls. The other patient recovered after a period of lethargy with slight meningism. Necropsy revealed a superficial and diffuse congestive and inflammatory process in the brain, with apparently normal cerebrospinal fluid. There was no meningitis, no tumor. One patient slept constantly, had ptosis and diplopia, headache and general depression, but no general disturbances and no rise in temperature. There was actual coma, with death, on the twenty-third day. Tuberculous meningitis was excluded. Another child, with somnolency, proved at autopsy to have a tumor of the hypophysis.

Cases from Lima and Buenos Aires<sup>18</sup> are also reported.

In the United States the syndrome was soon recognized. Jelliffe early called attention to it [1918], in his paper on the nervous disorders of influenza; he traced the historical development and outlined the chief syndromes. Later Bassoe, Barker, Cross and Irwin, Abrahamson, Climenko, Gordon, Ely, MacDonald, Mills and Wilson,

<sup>14</sup>ARDIN DELTEIL: *Bull. et mém. Soc. méd. d. hôp. de Par.*, 1918, xxxv, 42, 577.

<sup>15</sup>LOESER: *Med. Jour. South Africa*, 1918, xiv, 406.

<sup>16</sup>ABBRUZZETTI: *Riforma med.*, Jan. 31, 1920.

BETTI: *L'Osp. magg.*, 1919, vii, No. 12.

MARAGLIANO: *Cron. d. clin. med. di Genova*, 1919, No. 3.

ASCOLI: *Policlinico*, 1919, Nos. 31, 42.

MOLINARI: *Riforma med.*, 1919, No. 3, No. 5.

RE: *Riforma med.*, 1919, No. 40.

TACCONI: *Gazz. d. Osp.*, 1919, No. 39.

TOMBALATO: *Riforma med.*, Jan. 31, 1920.

DRAGOTTI: *Policlinico*, Oct. 6, 1918.

<sup>17</sup>MORQUIO, L.: Lethargic encephalitis. *Rev. med. d. Uruguay, Montevideo*, Aug., 1918.

<sup>18</sup>GARRAHAN: *Semana méd.*, 1918, xxv, 665.



Neal, Pottner, Strauss, Tilney and Riley, and others, reported cases occurring in practically all sections of the United States.<sup>19</sup>

*Clinical Picture.*—Barker, Cross and Irwin presented an abstract before the Association of American Physicians, representing a comprehensive survey of the broad group of epidemic acute and sub-acute non-suppurative inflammations of the nervous system prevalent in the United States in 1918-1919, under the captions encephalitis, encephalomyelitis, polyneuritis, and meningo-encephalomyeloneuritis.

The present discussion is limited to the more restricted syndrome, however, brought into somewhat spectacular prominence by v. Economo's study and claims. Hence his original study may prove a point of departure for this section. It is a study of the epidemic which made its appearance in Vienna in the winter of 1916. The most prominent symptom was the tendency to sleeping fits of long duration. After the exclusion of nutritional and toxic disturbances as the etiological factor influenza was the one suggested. v. Wiesener

- <sup>19</sup>ABRAHAMSON, I.: *N. Y. Med. Jour.*, July 5, 1919, cix, 17.  
 ALLEN, W. C.: *South. Med. Jour.*, May, 1919, xli, 231.  
 BARKER, CROSS AND IRWIN: *Am. Jour. Med. Sc.*, 1920, cl, 193, 337.  
 BASSETT, P.: *Jour. Am. Med. Assn.*, 1919, lxxii, 971.  
 BASSETT, P., AND HASSIN, G. B.: *Arch. Neur. and Psych.*, July, 1919, li, 24.  
 BEALL: *Texas State Jour. of Med.*, July, 1919, xv, 129.  
 BELEN: *Bost. Med. and Surg. Jour.*, 1919, clxxxii, 741.  
 BERGERON: *Arch. Neur. and Psych.*, 1919, li, 141.  
 CALHOUN: *Arch. Neur. and Psych.*, 1920, lli, 1.  
 CLIMENKO: *N. Y. Med. Jour.*, Aug. 9, 1919, cx, 234.  
 EADDY, J. G.: *Jour. South Carolina Med. Assn.*, July, 1919, xv, 500.  
 ELY, F. A.: *Jour. Am. Med. Assn.*, Apr. 5, 1919, lxxii, 985.  
 FAIRBANKS: *Bost. Med. and Surg. Jour.*, 1919, clxxxii, 578.  
 FLEXNER: *Med. Rec.*, May 24, 1919.  
 GORDON, A.: *N. Y. Med. Jour.*, May 17, 1919, cix, 837.  
 HEIMAN: *Am. Ped. Soc.*, July 19, 1919.  
 JELLIFFE, S. E.: *N. Y. Med. Jour.*, Nov. 2, 1918, 9.  
 KENNEDY: *Med. Rec.*, Apr. 19, 1919, xcv, 631.  
 McDONALD: *Arch. Neur. and Psych.*, 1919, li, 134.  
 MILLS, C. K., AND WILSON, G.: *Arch. Neur. and Psych.*, May, 1919, i, 567.  
 MORSE AND CRUMP: *Jour. Lab. and Clin. Med.*, 1920, v, No. 5, 275.  
 NEAL, J. B.: *Jour. Am. Med. Assn.*, March 8, 1919, lxxii, 714.  
 POTHIER, O. L.: *Jour. Am. Med. Assn.*, March 8, 1919, lxxii, 715.  
 ROBINSON: *Indianapolis Med. Jour.*, 1919, xxii, 163.  
 SACHS, B.: *N. Y. Med. Jour.*, May 24, 1919, cix, 894.  
 SCHNOOR: *Jour. Mich. Med. Soc.*, April, 1919, xvii, 141.  
 SCHULZ: *Jour. Am. Med. Assn.*, 1920, lxxiii, 732.  
 SHAW, J. F., AND BARTLETT: *Jour. Maine Med. Assn.*, May, 1919, ix, 284.  
 SKVERSKY: *Am. Jour. Med. Sc.*, 1919, clviii, 849.  
 STAFFORD, C. M.: *Jour. Lab. and Clin. Med.*, Aug., 1919, iv, 691.  
 STRAUSS, I., AND HIRSCHFELD: *N. Y. Med. Jour.*, May 3, 1919, cix, 772.  
 STRAUSS AND LOEUR: *Jour. Am. Med. Assn.*, 1919, 109, 772.  
 TILNEY AND RILEY: *Neur. Bull.*, 1919, li, 106.  
 TUCKER, B. R.: *Jour. Am. Med. Assn.*, May 17, 1919, lxxii, 1448.  
 WEGEFORTH, P., AND AYER, J. B.: *Jour. Am. Med. Assn.*, July 5, 1919, lxxiii, 5.

found a diplostreptococcus, which in monkeys produced a similar disease picture. This diplostreptococcus may perhaps be regarded as the cause of a disease resembling grip, the most marked clinical feature of which is encephalitis lethargica. At times it may assume a hemorrhagic character, and may also lead to a general hemorrhagic diathesis. Clinically the onset of the disease is acute. There is sometimes fever, but not always, and there is often delirium, which is independent of fever. There is nearly always a tendency toward sleep, usually without stupor upon awakening. It is not yet determined whether the tendency to sleep is a general symptom, or a local one in the sense of an interruption of the connection between the sense organs and the brain cortex, or an inhibition of the functions of the cortex through a center in the mesencephalon. There seems to be, as a rule, a slight cell multiplication in the spinal fluid. The number of polynuclear cells is usually increased. Often there are ocular disturbances, especially oculomotor paralysis (which may, however, disappear), as well as other bulbar disturbances. Slight paralysis of the extremities is frequent, and also disturbances of the reflexes; sometimes there are long-continued spasms of rigidity, athetosis, and more frequently ataxic affections, so that the disease picture may resemble that of acute multiple sclerosis.

The prognosis *quoad vitam* is unfavorable; of 13 patients 5 died, not from the severity of the symptoms, but from the final extension of the disintegration processes in the oblongata. *Quoad restitutionem* the prognosis is favorable. Macroscopically there is strong hyperemia of the soft brain membranes and, in acute cases, of the gray brain substance.

Microscopically, in acute cases, there is a slight involvement of the meninges in the form of foci, as well as of the brain cortex, of the basal ganglia down to the oblongata, also infiltration of the blood-vessels, interstitial infiltration of the gray substance, and neuronophagia. The escape of hematogenic elements into the nerve-tissue is ascertained, although it is not certain that the greater part of the infiltration cells are of this origin. Polynuclear leukocytes were seldom found in the nerve-tissue, especially in the more acute cases. The discovery of the neuronophagia, or rather the neurocytophagia, has nearly the value of a pathognostic discovery, but this phenomenon is always an isolated one, the part affected being at times entirely surrounded by sound tissue. The whole picture corresponds to polio-

encephalitis superior. The virus of infection seems to have a special affinity for the gray substance.

Encephalitis lethargica is a true inflammatory process of the nerve parenchyma with secondary small cell infiltration. The author compares his findings with those of other forms of encephalitis, and comes to the conclusion that some of the factors hitherto described belonged to this group. He assumes that polio-encephalitis lethargica produced by the diplostreptococcus of v. Wiesener may be epidemic, but that it may also appear sporadically. He distinguishes those encephalitides in which vascular changes occupy the foreground from the true inflammatory parenchymatous type, of which one form, the myelo-encephalitides, attacks principally the medulla, and another form, the polio-encephalitides, attacks principally the gray substance.

In the Obersteiner Festschrift (*Jahrbuch f. Psych. u. Neur.* 1917, xxxviii, 253) which later appeared in book form (Deuticke), v. Economo contributes a monograph study on the whole problem, which is summarized by our quotation.

The Public Health Service of the United States later published a collected study to call attention to the disorder, giving prominence to Netter's designation, and strangely adopted the opinion that it was a new disease. As this report brings the chief clinical picture into prominence it may be briefly abstracted:

The data collected in the course of these investigations indicate that the disease is an acute affection due to a specific virus, probably finding entrance through the nasopharynx, and having a special affinity for the nervous system. Pathologically, lethargic encephalitis belongs to the class of polio-encephalitic diseases which are inflammatory in character. It has been noted that clinically the disease is a general infectious disease characterized by manifestations originating in the central nervous system, of which the most frequent and characteristic are progressive lethargy or stupor, and lesion in or about the nuclei of the third pair of cranial nerves. In most cases, a prodromal period may be recognized. Usually the first symptom is simple catarrhal conjunctivitis and sometimes tonsillitis, sore throat, and bronchial catarrh; but the salient symptom in most cases has been progressive lethargy. Great muscular weakness is manifested, delirium is not uncommon, and irregular nonrhythmic spontaneous movements of the face, trunk, and limbs are not infrequent. Ophthal-



moplegia is perhaps the most common localizing sign. Seven types of cases have been recognized: (a) A clinical affection of the third pair of nerves; (b) affections of the brain stem and bulb; (c) affections of the long tracts; (d) the ataxic type; (e) affections of the cerebral cortex; (f) cases with evidence of spinal cord involvement, and (g) the polyneuritic type in which affection of the peripheral nerves is suspected. The most common diagnostic error is to attribute the condition to tuberculous meningitis. Lethargic encephalitis has a very definite clinical syndrome, characterized by progressive stupor or coma, alternating delirium, headache, giddiness, asthma, mental and emotional changes, and, in the majority of cases, by paralysis of the third pair of cranial nerves. No specific method of treatment has as yet been devised. In many cases, transient or permanent relief has been obtained by the withdrawal of cerebrospinal fluid by lumbar puncture. It has been observed that convalescence requires at least six months after the beginning of the illness.

(To Be Continued)

KRABBE, K. H.: Histologische und embryologische Untersuchungen über die Zirbeldrüse des Menschen (Histological and Embryological Examinations on the Pineal Body in Man) Copenhagen, 1915, (Danish) and *Anatomische Hefte*, 1916, Heft 163 (liv, Heft 2).

The author has examined microscopically 350 pineal glands from children and adults and 30 from fetuses, but only 40 of the glands were judged to be sufficiently normal to give reasonable normal results. These results were the following:

The pineal gland begins to develop in the second fetal month. It consists in the beginning of two parts, a fold of the row of the diencephalon and a cellular mass on the anterior wall of this fold. In the further development the cellular mass is joined to the walls of the fold, and the fold is shut. There remains of the diverticles only the pineal recessus and sometimes a little cyst in the pineal body. These cysts are surrounded by glia, and might be starting-points for the cysts and glia plaques which are often found in the pineal body in adults. During the last period of fetal life and the

first period after birth the parenchyma is metamorphosed. After the metamorphosis the parenchyma consists of three different elements: (1) pineal cells, (2) glia-cells, (3) nerve-cells. Every group of these cells shows characteristic signs. The granules in the nuclei which Dimitrowa has found are shown to be evacuated in the protoplasm. He does not believe in the existence of Loewy's pineal secretory capillary system. The connective tissue of the pineal gland is developed as early as the first year and is augmented in the following year. The amount of connective tissue varies very much; it may sometimes be found in small quantities in old persons and abundantly in children. In the connective tissue many mast-cells and "dust-bin cells" are found. The concretions are usually first found at the age of two years. Muscle-fibers are not found. The amount of parenchyma decreases only slightly from childhood to senility. The glial plaques, cysts, connective tissue and concretions are not to be considered as signs of involution, as they do not coincide with the destruction of the parenchyma. The pineal body is not to be considered as rudimentary. In regard to the function two theories may be advanced:

(1) That the pineal body has a nervous function, for instance that it is a sort of perceptive sensory organ regulating the pressure of the cerebrospinal fluid.

(2) That the pineal body is an endocrine gland.

The decision regarding this point can not be made in an anatomical way, although the existence of a number of amitotic figures points rather to a glandular than to a nervous function.

The paper is illustrated with 28 figures (colored lithographs, phototypes and autotypes).

S. E. JELLIFFE.

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## SECTION ON GENERAL MEDICINE

HOPKINS, A. H.: The Treatment of Climacteric Hypertension.  
*New York Medical Journal*, Dec. 6, 1919, cx, No. 23, p. 930.

The frequent occurrence of high blood-pressure in women at the menopause, and the paucity of the literature on this subject, led Hopkins to present this paper. The type of hypertension he describes has its onset at or soon after the menopause in apparently healthy women, who are frequently overweight. The common emotional instability of these patients is reflected in a similar instability in their blood-pressures. The earliest manifestations of the condition are symptoms constituting the gastric neuroses group with constipation and marked evidence of intestinal fermentation. The gastrointestinal symptoms are followed by nervousness and pains, chiefly in the extremities, headache, and later by cardiac difficulties. The blood shows no changes, as a rule, secondary anemia being present only in cases with complications. Repeated urine analyses, functional tests and forced feeding with proteids, at this stage of the disease, show nothing significant. For many years after the onset there is no evidence of fibrosis of the peripheral vessels.

The author ascribes the condition to the following etiological factors:

(1) A change in the glands of internal secretion, possibly a diminution in the functioning of the corpus luteum, with its accompanying effects upon the pituitary, thyroid and adrenals.

(2) The continuous worrying and mental strain which adds still further to the emotional instability of the patients.

(3) Constipation, which is very common in most of these women.

As a result of one or all of these factors there are spasmodic attacks of increased vessel tone, which gradually become more constant and which persist until finally, at sixty or thereabouts, evidence of vascular fibrosis becomes discernible.

In the treatment of these patients Hopkins first attempts to win and hold their confidence, and at the same time impresses them with the fact that their high blood-pressure does not necessarily mean the high blood-pressure of disease of the kidneys. These patients manage to carry on their daily life and activities until, at sixty years or later, either the heart begins to show evidence of decomposition, or a cerebral vessel ruptures and terminates the course of the disease. The cardiac decompensation probably occurs more frequently, and as the break is a gradual one, the physician is called upon to treat it, and not infrequently discovers at that time that his patient has had hypertension for years.

In the first stage of the disease the author takes a careful anamnesis, in order to exclude the possibility of previous diseases, which might have produced nephritis or arteriosclerosis. He also searches for possible local foci of infection, and examines the peripheral and retinal arteries for fibrosis. The finding of normal kidney functioning is a great aid in establishing the diagnosis of climacteric hypertension, particularly when the urine shows a faint trace of albumin and, at times, a few hyaline casts. After the diagnosis is certain, he regulates the patients' exercise, lengthens their hours of rest, and, where nervousness is a prominent symptom, orders them to stay in bed for breakfast. He combats their gastro-intestinal disturbances and their tendency to obesity. He regulates their water intake so that they receive from one to one and a half liters a day. As an aid to elimination, and to overcome the constipation, he orders high colonic irrigations with normal salt solution at least once a week. He also recommends an occasional dose of calomel, salts or castor-oil, and, in obstinate cases, administers paraffin oil



night and morning. In cases of spastic constipation he suggests benzyl-benzoate in the form of an emulsion with acacia in aromatic elixir of eriodictyon.

For elimination through the skin, a warm cleansing bath every other night, alternating on the other nights with a warm salt bath lasting from seven to ten minutes, is a useful means of bringing a general relaxation which promotes sleep, and at the same time has a beneficial effect on the high blood-pressure.

To allay the nervousness the above measures are combined with the administration of corpus luteum extract, by mouth or hypodermatically, according to the method employed in the nausea of pregnancy by John Cook Hirst. The corpus luteum may be used in conjunction with thyroid extract, in  $\frac{1}{2}$  grain (0.032 gram) doses, especially in obese patients. The author also advises sedatives such as *Cannabis indica*, sumbul, valerianate of ammonia, and bromids, if they do not disturb the digestion. (Bromids are in our opinion not advisable in these cases, because they retard elimination—Abstr.)

The author sounds a very important warning that "too great a reduction of pressure will do far more harm than good in any stage, and, indeed, the patients usually feel better with a pressure of from 200 to 300 than they do with a pressure of from 180 to 190 degrees."

The second stage of the disease is characterized by a greater severity of the symptoms of the first stage. The general measures enumerated above will serve for the second stage, but must be carried out more vigorously. The treatment is entirely symptomatic and must be individual. When pressure symptoms are threatening, sweat baths are indicated, but here again the condition of the patient's heart must be watched with great anxiety; in some cases a complete rest in bed for two or three weeks may be a safer procedure than sweating. At any time it may be necessary to resort to the nitrites. Of these, the writer prefers the spirits of glonoin, from 1 to 3 drops given three or four times a day. Sodium nitrite, although an excellent vasodilator, is not as good as glonoin, because of its tendency to aggravate an already existing disturbance of the stomach. The more severe and obstinate cases may require the withdrawal of from 250 c.c. to 350 c.c. of blood a day, for a few days.

The management of the third stage consists in the prevention of cardiac decompensation, and cerebral hemorrhage. Drugs at this

time are of little avail; guarding against mental and physical strain and directing the patient into the formation of habits conducive to a simple and quiet life is all that can be done.

M. KESCHNER.

WARFIELD, L. M., AND SMITH, F. M.: Studies on Irritable Heart.

II. Etiology of Irritable Heart. *Journal of Laboratory and Clinical Medicine*, Nov., 1919, v, No. 2, p. 75.

The term "irritable heart" is used by the authors in preference to "effort syndrome," "neurocirculatory asthenia," or "neurocirculatory myasthenia" to denote a group of symptoms brought out only by effort and found in connection with a number of diseases. The characteristic symptoms develop by exertion, which is far less severe than that required to bring out some or all of the same symptoms in a normal person. These symptoms are found typically in such different diseases as chronic malaria, cirrhosis of the liver, chronic focal infection, hookworm infection, pulmonary tuberculosis (early), exophthalmic goiter, and as a result of severe infection with the *Streptococcus hemolyticus* (empyema), and other organisms.

The group of symptoms denoted by irritable heart includes: breathlessness, pain, exhaustion, giddiness, and fainting, also, less frequently, palpitation, headache, lassitude, coldness of the hands and feet, irritability of temper, sleeplessness.

Of 275 cases showing these symptoms observation showed 33 cases to be normal; there were 78 cases of hyperthyroidism, 94 of pulmonary tuberculosis, 4 of irritable heart, 4 of cirrhosis of the liver, 41 of bronchial asthma. In true cases of irritable heart serious illnesses were excluded as an important etiological factor. The neuropathic element played an important part. The symptoms may be caused by some slow chronic poison acting on the nerve- and muscle-cells. The victims seem to be "constitutionally defective." The true irritable heart shows one factor not usually found in other cases, that is, a history of disturbance dating back for years with no definite cause.

C. M. ANDERSON.

HERRICK, J. B.: Report of a Case of Rupture of an Aortic Aneurysm Into the Left Innominate Vein. *American Journal of Medical Sciences*. Dec., 1919, clviii, No. 6, p. 782.

The author reports the forty-third recorded case of aortic aneurysm rupturing into the superior vena cava, immediately joining the left innominate vein. The patient was a physician thirty-three years old. He had suffered for six months with increasing chest pain radiating into the right arm. After climbing stairs there was a sudden feeling of giving way in his chest, characteristic cough, orthopnea, edema of the face, neck, and body extending to a line of demarcation above the umbilical level. The color was purple, almost black. The heart was difficult to percuss. The base dullness was widened, and over it was a systolic murmur lasting into diastolic, transmitted to the intercapsular region. Over the aortic cartilage a distinct, continuous, soft, blowing, humming murmur was heard. In the lungs were dry and moist râles, with a suggestion of pleural fluid at the bases. The Wassermann was strongly positive. X-ray showed an aneurysm of the first or transverse portion of the aorta. Death followed about a month and a half later with no decrease in symptoms. The autopsy revealed a rounded aneurysmal sac, 7 cm. in diameter, situated 4 cm. above the aortic valves, ruptured into the left innominate vein, less than 1 cm. from the cava. Pathologically it was an old, active, typical luetic aortitis.

A. T. MAYS.

DOUGLAS, B.: The Reaction of the Leukocytes in Epidemic Influenza. *Bulletin of the Johns Hopkins Hospital*, Nov., 1919, xxx, No. 345, p. 338.

From a study of the leukocyte-counts in a large number of cases of influenza during the recent epidemic, the author concludes that leukopenia is the rule in epidemic influenza, although a few cases may show normal counts or a slight leukocytosis. The leukopenia is frequently present on the first day of the disease, after which it may become more marked for a few days, with a subsequent tendency to rise gradually until the normal mark is reached. In some cases the normal mark is overshoot during convalescence, and leukocytosis



may be present. There is no constant relation between the leukocyte-count and the severity of the disease. Persistence of the leukopenia is the rule, even when bronchopneumonia, fatal or non-fatal, supervenes. Differential counts show a relative and absolute decrease in the polymorphonuclear cells. Acute non-influenzal respiratory infections are, as a rule, accompanied by a leukocytosis. A leukopenia is, therefore, a reliable diagnostic sign in epidemic influenza.

T. HOWARD.

WILCOX, R. W.: The Therapeutics of Aspidosperma (Quebracho). *Medical Record*, Oct. 25, 1919, xvi, No. 17, p. 698.

Quebracho became official in the U. S. P. on Sept. 1, 1916, and Wilcox says that it is a valuable remedy in cases of embarrassed breathing, as in emphysema, chronic bronchitis, or chronic pneumonia; in many instances, it gives almost instant relief. In proper doses it relieves not only the dyspnea, but also the cyanosis and the sense of "choking." It stimulates the respiratory center and assists the oxygenation of the blood. Its alkaloid, aspidospermin, represents fairly well the physiological action of the drug, and it has the further advantage that it may be given hypodermatically in  $\frac{1}{2}$  grain (0.032 gram) doses.

It may relieve symptomatic asthma when it is due to uremia or cardiac failure. It is of aid in shortness of breath due to cardiac hypertrophy, on account of its depressant effect upon the cardiac musculature, and its influence on the nervous mechanism of respiration, which may even extend to the cardiac innervation. Because of its effect on the oxygenation of the blood it may also be used in asthma due to secondary anemia. Although its action is not curative, it seems to prevent a recurrence of the paroxysms.

After the administration of the drug there is usually a sensation of warmth in the head, some sweating and frequently slight salivation. The dose required for this purpose is from  $\frac{1}{2}$  to 1 teaspoonful every two to four hours; if long continued it is followed by nausea.

Wilcox is not prepared to advocate the use of quebracho in the dyspnea of mitral insufficiency unless the lesion is well compensated by cardiac hypertrophy.

In spite of the work done with this drug by Wood, its employment must still be said to be empirical. The author concludes his article by saying that "forty years of clinical observations have established the value of the remedy, so that it has properly been admitted to the pharmacopeia. Personally I have obtained brilliant results from its administration and occasionally had equally inexplicable failures."

M. KESCHNER.

BERRY, F. B.: Report of Three Cases of Combined Tumors of the Kidney in Adults. *Journal of Medical Research*, September, 1919, xl, No. 3, 459.

Berry records the cases of 3 adults from whom large kidney tumors were removed, with fatal results in two cases; the third, a man of seventy-two, made an uneventful recovery. The first proved to be a hypernephroma or adrenal cell carcinoma and a fibrosarcoma of the kidney, the second a papillary adenocarcinoma and fibrosarcoma, also of the kidney, and the third an adrenal cell carcinoma and leiomyosarcoma. The third, in which the sarcoma was of the smooth muscle type, precluded the possibility of its being merely overactive stroma, and the author is inclined to place the first two in the same class with the third and regard them all as true combined tumors.

T. HOWARD.

GRAVES, S.: Primary Lymphoblastoma of the Intestine. Report of Three Cases, One with Apparent Recovery after Operation. A plea for a Logical Classification of Tumors. *Journal of Medical Research*, September, 1919, xl, No. 3, p. 415.

Graves pleads for a classification of tumors according to the histogenesis of their type of cells. He urges Mallory's definition of "lymphoblastoma" as meaning "a tumor of mesenchymal origin of which the cells tend to differentiate into lymphocytes, that is, into cells of the lymphocyte series." This includes what are commonly known as "lymphocytoma," "lymphoma," "lymphosarcoma," and in most cases, so-called "round-celled sarcoma." Within this group, he has

collected from the literature 246 primary tumors of the intestine. To this list he adds a very full clinical and pathological study of 3 further cases. Each presented a typical picture of chronic progressive intestinal obstruction, loss of weight, and a mass in the abdomen. One is in good health three years after the operation, one died of metastasis of the lungs and elsewhere, seven months after operation, and the third apparently has a recurrence within the abdomen thirty-eight months after the operation.

In reviewing the literature, Graves shows that males are more often affected than are females, and that no age from one to eighty is exempt. Although the condition is usually regarded as fatal, it is seen from the cases reported in the last ten years that a number of patients have lived for years after operation without recurrence.

T. HOWARD.

HOWARD, C. P., AND ROYCE, C. E.: Progressive Lenticular Degeneration Associated with Cirrhosis of the Liver (Wilson's Disease). *Archives of Internal Medicine*, Nov. 15, 1919, xxiv, No. 5, p. 497.

A case occurring in a previously healthy man of 22 is reported in great detail. Mentally the subject was distinctly emotional, but otherwise normal. He exhibited peculiar choreiform movements of the extremities, muscular rigidity and hypertonicity, and painful spasmodic contractions. There was a tendency to grasp spasmodically various objects, such as the bed-clothes, the back of a chair, or the hands of the examiner, resulting in a painful spasm until he was disengaged by the nurse or attendant. The examination of the reflexes, both superficial and deep, and of the various forms of sensation, as well as of the special senses, was entirely negative, as is usual in this disease. No signs of hepatic insufficiency were manifest. The patient died of an acute infection, and autopsy showed progressive degeneration of the neuron and glial elements of the basal ganglia, most extensive in the lenticular nucleus but involving the optic thalamus, caudate nucleus, internal capsule, and red nucleus, and to a slight extent the white matter just below the grey matter of the cortex. There were also a chronic interstitial hepatitis,



lymphoid hyperplasia manifest in spleen and retroperitoneal lymph-nodes, acute congestion of spleen and kidneys, and colloid cystic degeneration of the parathyroid glands.

T. HOWARD.

OERTEL, H.: The Essential Atrophy of the Pancreas. *Journal of Medical Research*, September, 1919, xi, No. 3, p. 289.

Oertel reports a pathological entity consisting of an essential atrophy of the pancreas, basing his description upon a study of 5 cases. The condition is characterized by a degeneration and collapse of the parenchyma which occurs independently of either vascular or inflammatory changes or of an increase in fibrous connective tissue. The islands of Langerhans are involved in the process. Evidences of regeneration are frequent, but are overshadowed by the degeneration. The pancreas is diminished in size and weight, but the configuration of the organ is fairly well preserved. There may be some distortion, especially due to greater loss of substance in the tail end.

Clinically the disease occurs in youth or middle age and is associated with a severe diabetes.

Oertel suggests that the process represents an exaggeration and perversion of the normal cycle of cell atrophy and regeneration which was first pointed out by Reitmann as occurring in the pancreas.

T. HOWARD.

CHAPIN, M. K.: Some Small Communities and What Their Hospitals Mean to Them. *The Modern Hospital*, Nov. and Dec., 1919, Jan., 1920, xiv, No. 1, p. 24.

In a series of three articles, Miss Chapin takes up this important problem. The health of the farming community is as vital a matter as that of the industrial one. A hospital need not necessarily conform with certain specific requirements, however desirable these may be, but should first of all justify its existence by the measure of its service to the community.

Is the community better off with its hospital or without it, is the question to be answered. If the answer is "Yes" then all forces should combine to improve the service rendered.

If there happen to be several small struggling hospitals in one area it would seem best not to attempt a full equipment of expensive laboratory and x-ray apparatus in each, but, by establishing full coöperation among them, to be assured of one laboratory where, with adequate facilities and trained workers, the needs of all the hospitals can be supplied.

The problems of a number of actual communities, which have been given fictitious names, are discussed, and suggestions are made. The evils of rivalry and competition between institutions in the same vicinity are shown in contrast with "a rural community and public health center which is not merely an institution but an embodiment of a constructive idea, with special emphasis laid upon the original features of social and medical organization and financial methods.

"A hospital may cease to be a repair shop, interested only in the cure of the patients within its walls, and become a social institution devoted to the prevention of disease, as well as an active educational force in the community."

B. v. H. ANTHONY.

KRABBE, K. H.: Infantilism (l'Infantilisme). *Nordisk medicinsk Arkiv*, 1919, Afd 2, li, No. 21.

The author gives the histories of 4 cases of infantilism in children. The results of his considerations are the following: In defining the infantilism it must be emphasized that it is a combination of stoppage of the growth with incomplete development of the genital organs. The infantilism is to be sharply distinguished from eunuchoidism, but can scarcely be distinguished from chétivism.

Infantilism may be produced by diseases in the thyroid gland and in the pituitary body. These forms may be called dysendocrine infantilism. But in other cases the infantilism may be found without any other sign of endocrine disease, and it is not proved that these infantilisms are related to the endocrine organs. This form of infantilism may be called essential infantilism, the term meaning that we do not know anything about the origin of such cases.

S. E. JELLIFFE.

STRAUSS, SPENCER G.: Malignant Neoplasms of the Thymus Gland.  
*New York Medical Journal*, Oct. 18, 1919, ex, No. 16, p. 646.

In reviewing the literature on the subject, the author remarks. one is struck with the fact that this pathological phenomenon is comparatively rare, and that, on account of this lack of material, the theoretical questions involved have been poorly worked out. It is accepted at the present day that the thymus is originally purely of entodermal origin. These outgrowths of epithelium become separated from their point of origin and continue their growth independently, and in the older embryos the gland is found to be composed of this paired epithelium lying between the upper limit of the pericardium and the isthmus of the thyroid. Fusion is almost never complete, and the gland always maintains its bilobar character.

It has been customary to consider the normal thymus as growing up to the second or third year, when it begins to atrophy, until at puberty nothing is left of it. Recently this view has been greatly modified. Bosanquet states that usually no vestige of it is left at the age of twenty, although traces may be found microscopically up to old age. Some claim that the gland enlarges until puberty and then begins to atrophy, but does not entirely disappear until the age of forty. Others state that it begins to atrophy at birth and does not disappear until the fortieth year. Pappenheimer believes that the gland reaches its maximum growth at about the fifteenth year, when it begins to undergo involutional changes, at first quickly, later slowly. Some thymic parenchyma may be demonstrated even in the aged.

As to the origin of the apparently lymphoid cells of the mature glands, equally conflicting views are found. The latest researches do not prove the origin of the lymphoid cells, but do show that the epithelium is transformed into the reticular tissue of the thymus in which the lymphoid cells, whatever their origin may be, undergo mitotic division, the Hassal corpuscles representing compressed parts of the reticulum. M. Simmonds immediately raised the point that if the thymus is regarded purely as epithelial, one would have to characterize as carcinomata all growths which were previously named sarcomata and lymphosarcomata, but he himself agrees that a purely genetic classification of neoplasms is unsatisfactory, and that the morphology of the mass must be the deciding factor. The author is



inclined to accept this point of view. From the cases hitherto reported it seems that sarcoma is more frequent than carcinoma in the young, and that carcinoma is more frequent in the old.

In the diagnosis of a thymic growth, Strauss takes into consideration the following factors: (1) The position of the growth, (2) its form, (3) any possible connection with remnants of the thymus gland, and (4) the structural elements of the growth.

The neoplasm is usually located in the place formerly occupied by the thymus, but this is no reason for saying that the growth is absolutely thymic in origin, as in the larger growths where other structures are implicated, it may be impossible to determine its points of origin. All malignant neoplasms being as a rule irregular in outline, the form of the growth cannot be considered a diagnostic criterion. The finding of thymus remnants in the growth is not conclusive, as often the neoplasm begins outside of, but finally includes, the thymic rest. The morphology of the cell elements of the neoplasm is the one factor upon the basis of which a diagnosis may be made. Although the presence of Hassall corpuscles in the mass absolutely determines its thymus origin, their absence does not prove anything, for it must be remembered that they are at best not easily found, and that they occur chiefly at the periphery of the gland and only in fresh specimens; as the gland matures these bodies grow less and less numerous.

The article is concluded with the recital of a case seen by the author in the Lenox Hill Hospital in New York City. Owing to the rarity of these cases it is advisable to include the history of the case in this abstract of the original article:

Patient, M. B., white, male, sixty years old, was seen by Strauss four months before death. At that time he complained that his face and neck had become swollen, that he had lost weight rapidly for some time past, and that he had some difficulty in swallowing and speaking. A month later he was seen again, when it was found that his heart was slightly displaced downward. Two months later he was admitted to the hospital. A complete physical examination showed: no general skin eruption, icterus or edema; the entire skin loose, dry, and somewhat distended; marked caput medusæ; face and neck somewhat blue; general adenopathy, most marked in the left axilla and in both inguinal and femoral regions; some exophthal-

mos with a slight Moebius and some lateral nystagmus; tongue slightly coated and dry; tonsils and fauces markedly congested; no tracheal tug; thorax slightly prominent to the right of the sternum in the first and second costal spaces. This area was dull on percussion for 5 cm. to the right of the sternum; the dullness extended down to, and was continuous with, the liver dullness; this area was somewhat tender but not discolored. No thrills or pulsations were felt. The heart-sounds were slightly rapid but normal. There was no change in the radial pulses. Both lungs were slightly emphysematous, with signs of bronchitis posteriorly over the base of the right lung. The liver was palpable just beneath the free costal margin. There were no masses or tender areas in the abdomen. No changes were found in the tendon reflexes. Laryngoscopic examination showed the right vocal cord to be immovable and partially abducted; the left cord was only slightly movable. The x-ray examination showed the presence of a mediastinal mass over the base of the heart. A severe attack of dyspnea ten days antemortem necessitated the performance of a tracheotomy. The blood showed secondary anemia with a slight leukocytosis. The temperature ranged between 99° F. and 100° F., (37.22° and 37.78° C.); the pulse was 100-110; respirations were between 20 and 30.

A partial autopsy was performed. The contents of the entire mediastinum were removed. Over the base of the heart an irregularly shaped mass, which measured about 5 cm., was found exactly in the position normally occupied by the thymus. The heart was somewhat enlarged and the musculature uniformly hypertrophied. On opening the heart it was found that the lumen of the superior vena cava had been entirely obliterated by compression from without. The growth was also found to extend into the musculature of the interauricular septum. The bronchi and other mediastinal structures were normal. The thyroid was in its proper place, and was found to be normal. A section of the mass showed it to be a squamous celled carcinoma. No Hassal corpuscles could be demonstrated. A search for metastases was impossible because a complete autopsy was not permitted.

M. KESCHNER.

MAHLE, A. E., AND MACCARTY, W. M.: Ectopic Adenomyoma of Uterine Type (A report of 10 cases). *The Journal of Laboratory and Clinical Medicine*, Jan., 1920, v. No. 4, p. 218.

The importance of adenomyoma has not been recognized either clinically or surgically. The 10 cases herewith reported were of extra-uterine and extratubal tumors, diagnosed at the time of operation as adenomyomas. These growths contained glandular portions resembling typical uterine mucosa, surrounded by a fibrous connective tissue, and smooth muscle stroma, the latter in varying amounts. The distribution of the tumors was as follows: umbilicus 1, abdominal wall 2, sigmoid 1, groin 2, and rectovaginal septum 4.

The authors cite these cases and draw the following conclusions: Pathologically, extra-uterine adenomyomas are identical in appearance, regardless of where they are found. They differ grossly from adenomyoma of the uterus in that the cystic areas are larger and the contents darker brown. Grossly, the tumors are solid, fibrous, and of a light gray color. Here and there, white bands extend into the tumor substance, while between these bands are areas, from dark brown to almost black, varying in size from portions as small as the head of a pin to cystic areas 1 cm. or more in diameter. On pressure, a dark brown fluid exudes from the larger cystic areas.

Clinically, these tumors give no consistent group of symptoms on which an accurate diagnosis can be based. However, their location and their slow growth, extending over a number of years, suggests benign tumors. Further, the occasional relation between the time of menstruation, and pain or swelling of the tumor, or, less frequently, a bloody discharge, should be very suggestive of adenomyoma.

Surgically, adenomyomas, regardless of their remarkable infiltrative characteristics, should be differentiated from malignancy. This is especially true of tumors in the pelvis adherent to the sigmoid or to the abdominal wall or other structures. Adenomyoma may be grossly recognized in most cases by the fibrous stroma, which contains cystic areas filled with a bloody, dark brown, or serous fluid.

The pathologist should distinguish adenomyoma from carcinoma by the regularity of the gland structure, and by the fact that these tumors grow by invasion, and do not metastasize.



The author's cases occurred between the ages of twenty-nine and fifty. Pregnancy apparently had no influence on the condition.

Our knowledge of the origin of these tumors is at present only theoretical. Von Recklinghausen thought that they arose from the wolffian body or duct, and, later, Aschoff suggested their origin from the epithelium of the peritoneum of the various regions in which these tumors are found. Cullen believes that they originate in remnants of Muller's duct, or in misplaced uterine endometrium. No doubt more extensive work on the embryology of the genito-urinary tract will solve this interesting problem.

C. M. ANDERSON.

HUTINEL, V., AND STÉVENIN, H.: Hereditary Syphilis and Dystrophies. *Archives de médecine des enfants*, Paris, Feb., 1920, xxiii, No. 2, p. 77 (Second article. First is in this journal for January, 1920, xxiii, No. 1).

Hutinel and Stévenin believe that many affections and conditions formerly considered independent may be traced to syphilis, such as some nutritional disturbances, and (1) direct or partial dystrophies which are more or less localized, (2) indirect or generalized dystrophies, and (3) hereditary dystrophies. Dystrophies are probably the result of endocrine disturbances, and syphilis as well as alcoholism and other causes may affect the endocrine glands. Partial dystrophies are the most numerous and are local manifestations of a general process, as, for instance, cranial and nasal malformations. Some date from birth, others are lighted up later by ordinary infections. All types of *monstrosities* (arising in embryonic life) are seen in syphilis; none are specific, *i. e.*, anencephalus, pseudo-anencephalus, eventration, meningocele, syndactylism, multiple malformations, etc. The proportion of syphilis is raised in twin pregnancies, especially in cases of single ovum twins. The same is true of *malformations* and *anomalies* (arising in fetal life). Local dystrophies, *i. e.*, skull malformations, pronounced pericranial veins (especially the superior temporal vein), anomalies of the teeth (Hutchinson's teeth, etc.), delayed dentition and walking, foot malformations, are frequently luetic, and antisiphilitic treatment often arrests them. The authors quote 3 cases to illustrate this. The malformations of

severe rickets are often associated with syphilis. Interstitial keratitis is practically always luetic. Syphilis is frequently manifested by interstitial sclerosis of the lungs, mediastinum, liver, spleen, kidney, etc., in young children. The treponema may be latent in certain organs and be lighted up by common infections. Syphilis in a tuberculous patient progresses rapidly at first, and later becomes amenable to treatment. Tuberculosis in a luetic first seeks the areas already affected by syphilis, i. e., the bones, joints, etc., and can generally be cured.

W. C. DAVISON.

(To Be Continued)

MEANS, J. H., AND AUB, J. C.: The Basal Metabolism in Exophthalmic Goiter, *Archives of Internal Medicine*, December, 1919, xxiv, No. 6, p. 645.

This study consists of an elaborate report of the results of many observations on a series of 55 cases of exophthalmic goiter, checked by numerous controls. Previous impressions as to the reliability of the basal metabolism as an index of toxicity in this disease were confirmed. Certain conclusions in regard to the treatment were arrived at by studying these cases from this point of view. It was found that in the majority of cases the results after two or three years of roentgen-ray treatment were just as good as those of surgery. After surgery the metabolism shows a rapid preliminary fall, and a secondary rise followed by a final fall, while with the roentgen-ray treatment there is a gradual progressive fall. Although one secures the same end results with surgery as with *x* rays, a lesser rest factor is necessary with the *x*-ray.

With the roentgen-ray there is practically no mortality, while with surgery there is a definite one. Patients treated surgically recover more quickly, and the risk of operation is less, if they have previously had their thyroid and thymus glands irradiated. The risk of operation and the need for preliminary irradiation are greater in cases with a very high metabolism and moderate tachycardia than in those with an extreme tachycardia and moderate metabolism elevation. The safest program for the treatment of exophthalmic goiter as a whole is the routine irradiation of thyroid and thymus glands

in all cases, with surgery held in reserve for patients who do not then improve. Surgery is contra-indicated with patients whose metabolism is rising in spite of rest in bed, and also with patients of the type with moderate tachycardia and great increase in metabolism, except when their thyroid and thymus glands have been previously irradiated. In the management of exophthalmic goiter, the authors believe that the periodic determination of the basal metabolism should be quite as much a routine as is the examination of the urine for sugar in diabetes mellitus, and that in border-land cases the basal metabolism furnishes a very valuable aid in differential diagnosis.

T. HOWARD.

MEREDITH, F. L.: The Treatment of Early Hyperthyroidism.  
*New York Medical Journal*, Feb. 14, 1920, cxi, 289.

In a recent series of routine medical examinations among 700 girls, Meredith found 44 cases of early hyperthyroidism. From the accounts these girls gave of their previous medical experience, she gained the impression that many physicians either do not recognize early symptoms of hyperthyroidism, or do not consider those manifesting them as suitable patients for any treatment. Some of the patients brought certificates from their family physicians saying that they were in perfect health.

Out of the 44 cases in which Meredith established this diagnosis 14 patients could not be advised because they were under the care of other physicians and came to the author only for examination. Thirty were treated by the removal of any discoverable source of bacterial toxemia and by normalizing the entire life by general hygienic measures. In all but 4 cases a considerable improvement was noted, and in 6 a complete disappearance of symptoms. In a number of the remaining patients the improvement was so great that an ultimate normal activity of the thyroid gland may be expected. The size of the gland and the already existing ocular symptoms have in no case shown much improvement.

The diagnosis in each case was made painstakingly in order to make sure that if improvement resulted it was an improvement in a mild yet definite thyrotoxicemia. The measures employed would naturally be conducive to an improvement in the general health, in the



absence of any pathological condition. The author wished to prove that a pathological condition, often not treated in this way, could also be improved. The girls were for the most part between the ages of sixteen and twenty-six, and most of them were examined as a routine procedure. A few of them presented themselves voluntarily on account of subjective symptoms. Most of them were unaware of any special ill-health, although they were not satisfied with their general condition. Most of the patients showed several important symptoms of a mild hyperthyroidism, and some showed positive laboratory findings. The symptoms in the 30 cases occurred as follows:

Goiter.....	+21 - 9	(In one case it was sub-sternal)
Tachycardia.....	90 in 4	(The heart rates are those taken with the patients at rest)
	80 in 1	
	86 in 1	
	88 in 2	
	80 in 1	
	94 in 1	
	100 in 5	
	104 in 1	
	108 in 1	
	110 in 1	
	116 in 1	
	120 in 1	
	80-100 in 1	
	94-120 in 1	
Paroxysmal up to.....	160 in 1	
No tachycardia.....	in 7	
Nervous symptoms....marked	in 1	
	ordinary in 15	
	none in 10	
	slight in 4	
Exophthalmos.....slight	in 1	
	negative in 18	
	positive in 11	
Von Graefe.....absent	in 22	
	slight in 2	
	present in 6	

Sweating.....	present	in 14
	absent	in 16
Underweight.....	present	in 17
	absent	in 13
Appetite.....	good	in 12
	slight	in 1
	poor	in 17
Diarrhea.....	rarely	in 1
	present	in 7
	absent	in 22
Menstrual disturbances	present	in 15
	absent	in 15

Epinephrin tests in 10 cases were positive in 5 cases.

Basal metabolism tests in 16 cases were positive in 11 cases.

Thyroid feeding tests in 16 cases were positive in 12 cases.

Diseased tonsils were found in 7 cases and removed; 14 patients had bad teeth, which were either treated or extracted; 1 had chronic otitis media, which was treated; 15 had chronic constipation. Two had severe attacks of influenza within a year.

A conspicuous feature in the case of all the girls was the fact that practically none of them adhered to the ordinary rules of living and good health. Some were overactive physically or mentally, or both. Some had no rest and sought no recuperation. Many of them lived almost entirely on a carbohydrate diet. Most of them drank little water, but a good deal of tea and coffee. Movies and flirtations were the main diversions. Very few even danced often. Some of them knew nothing of fresh air or exercise.

All of the patients were instructed to live hygienically. According to the author's experience the cases which do not respond to healthful living and normal activity have become so advanced that they will ultimately become cases for surgical interference, and had perhaps better be treated as such at once.

The mental health of these girls was also investigated with care. Emotional disturbances, nervousness, alternating depression and exhilaration, were the principal subjective symptoms in many cases. It was found that whatever emotional instability was present was apparently due to hypersecretion rather than the cause of it, the history in each case except one pointing to the simultaneous appearance of the nervous and other symptoms.

The general impression which Meredith gained from this study was that the normalizing of the patient's life is the most logical treatment for early hyperthyroidism.

M. KESCHNER.

MOYNIHAN, SIR B.: The Diagnosis and Treatment of Chronic Gastric Ulcer. *British Medical Journal*, Dec. 13, 1919, ii, No. 3076, p. 765.

A full, clear, and truthful description of the symptoms of ulcer is rarely given in the text-books, and is most necessary for diagnosis. Ulcer occurs twice as frequently in men as in women, and its chief symptom is pain, which occurs regularly. The length of time after taking of food at which it occurs depends upon the location of the ulcer, and the type and speed with which the meal is ingested. It is most important to ascertain how this pain is altered by taking food or other substances, and the sequence: food, comfort, pain, food, comfort, pain, is the most valuable of all the clinical data for diagnostic purposes. The symptom next in frequency is vomiting, which is infrequent when due to an ulcer, and rarely occurs directly after taking food. The meal causes relief at first, but, after this period of relief, vomiting occurs. Hematemesis is far less frequently present in ulcer than is supposed, as is also melena: they were present in only 25 per cent of cases, and the loss of blood in the majority of these cases was slight. Acute gastric hemorrhage is due far more frequently to other causes. The chemical examination of gastric contents is also of little value, since hyperacidity may exist in many other conditions. The roentgenographic is the one positive method of diagnosis, and is an indispensable addition to the older procedures. No diagnosis of gastric ulcer should be accepted unless its presence is made certain by x-ray or operation. The medical treatment of ulcer should be prolonged and followed by roentgenographic examination. The tendency of ulcer is to recur, and there is evidence that scars degenerate. Gastro-enterostomy should be performed where there is existing or threatened obstruction; this, combined with gastrectomy, and prolonged feeding through a jejunostomy opening, is considered the safest and surest surgical cure.

L. C. JOHNSON.



PORTER, L.: A Retrospect of Fifteen Years' Experience in the Treatment of Hypertrophic Pyloric Obstruction in Infants. *Archives of Pediatrics*, July, 1919, xxxvi, No. 6, p. 385.

There have been for years two schools of thought on this subject: (1) those who, like Hutchison, believed in treating the condition purely from a medical standpoint, the treatment consisting in daily lavage of the stomach with an alkaline solution, the local application of heat to the stomach, and the use of antispasmodics; and (2) those who resorted to operation. Many attempts have been made to perfect a technic so simple as to produce the least possible shock and at the same time relieve the symptoms of obstruction. In the nineties, pyloroplasties and later gastro-enterostomies were used with varying success. The author gives more credit to Fredet, a French surgeon, for the so-called Rammstedt operation of the present day.

Study of a series of 17 cases in which gastro-enterostomy was performed, with 5 deaths and 12 recoveries, and later of another series of 26 cases in which the Fredet-Rammstedt technic was used, with 2 deaths and 24 complete recoveries, and a consideration of the wonderful results obtained by Dr. Holt and Dr. Down in a large series of cases by the latter method, have led the author to prefer this operative procedure to others. He recommends it as a safe procedure in all stubborn cases, if it is used early enough.

The last 10 cases reported by the author have been treated by the feeding of thick cereals. A 10 per cent solution of rice flour in a low fat milk mixture was used. Under treatment by this simple method all cases recovered. These cases are reported in detail. When necessary, water depletion is made up for by administering normal saline intraperitoneally or per rectum.

T. B. GIVAN.

DARLING, S. T.: Sarcosporidiasis in an East Indian. *The Journal of Parasitology*, 1919, vi, 98.

Sarcosporidian cysts were found in the muscles of the tongue of an East Indian who died of anemia, due to a long-standing malarial condition. Before death the tongue showed signs of atrophy and

desquamation common to an impoverished condition following malaria. Postmortem examination showed no gross evidence of sarcocysts, neither was there any sign of degeneration or of inflammation in the neighborhood of the cysts found in the tongue tissue. The method of infection is unknown, but the suggestion is made that the sporozoan enters the host through food or drink contaminated by an insect or by some other invertebrate. After gaining the muscle-tissues of the strange host the life history cannot be completed and escape is impossible. This infection, like that of leishmaniasis, is an example of a parasitological blind alley. The infection is rare, only 2 other cases having been previously reported, and it is of little if any pathological importance.

L. GREGORY.

LEGGATE, A. R.: Observations on Beriberi Among the Chinese in France. *Edinburgh Medical Journal*, Jan., 1920, xxiv, No. 1, p. 32.

In 1917, the above writer observed 269 cases of beriberi in the Chinese General Hospital in France. These cases covered both types, the wet and the dry. In the former type the first symptom was anasarca. This was general, but was most easily detected and usually most severe in the lower limbs. The dry cases showed no edema whatever.

His observations support the view of the intimate association of a polished rice diet as an etiologic factor.

He reviews the reports of two medical officers from different ships which carried coolies from China. In the first report the coolies received two meals per day of unpolished Canton rice. This was steamed, cooked, and was given with meat and vegetables. Although the rice was of poor quality no cases of beriberi were seen on board.

The second report covers a shipment of coolies which left China in the same month of 1917 as the first. The diet was of polished rice, and the average consumption was 1.72 lb. per head per day. The first case of beriberi was seen on the thirty-seventh day. Many cases appeared and 7 patients died. One month after the appearance of the first case the ship called at a port and the medical officer

succeeded in obtaining 15 bushels of unpolished rice, only sufficient to give to the beriberi cases. Four days later a general improvement was noted and no death occurred.

A third report, by Lieut. E. F. Wills, is also of interest. Food had been put on board on the outward voyage at Hongkong. The rice was Saigon rice. This formed the staple food at the two daily meals. Saigon rice goes through a process of steaming, and is then highly polished, absolutely no pericarp being left. Major Rockwood, at Colombo, described this as the rice most apt to cause beriberi. When the ship reached Colombo there were 46 cases of edema. The rice was condemned and a daily allowance of peas, beans, dahl, and ghee were given. Finally, 20 of the 46 were left on shore; the remainder recovered. After leaving a South African port the supply of peas and beans gave out. Beriberi again occurred, and by the time the next port of call was reached 20 cases were being treated. Peas, etc., were again secured, sufficient for the remainder of the journey. The patients were given one ounce (daily) of yeast made from hops, and at every meal peas, beans, and lentils were served. On reaching the port of disembarkation only 2 or 3 showed slight remaining traces.

Of the cases admitted to the hospital 200 showed edema of the legs and body, but of these, 46 showed no other symptoms. One hundred and eighty-three showed loss of deep reflexes, and of these, 7 had no other symptoms, 155 had paresthesia; 9 of these were without any other symptom.

The order in which the symptoms appeared were: first, edema; second, paresthesia; and third, loss of the deep reflexes. Inability to rise from a squatting position without the aid of the hands, or without other assistance, was a feature of the dry cases, and an exception in the wet type. Of 154 wet cases, 10 showed this symptom, *i. e.*, 6.5 per cent. Of 53 dry cases 35 showed this symptom, *i. e.*, 66 per cent.

Other symptoms which were not common, but which were occasionally complained of, were diarrhea and paresis of the larynx.

Cardiac weakness, as indicated by dilatation of the heart and dyspnea, was seen in the well-marked cases. As a rule it was found that the uncomplicated cases of beriberi showed no febrile symptoms, loss of appetite, or any quickening of the pulse.

Under treatment it was found that scorbutic symptoms soon



cleared up on a fresh vegetable diet, but this was not the case with the beriberi symptoms.

With a diet of fresh vegetables and the finest quality of polished rice, it was found that after one month there was little general improvement. But when the rice ration for the beriberi cases was replaced by flour, there was a general improvement, noticeable within three days' time, and in six days' time the edema had completely disappeared in the most edematous cases.

That the stopping of the rice diet had a most marked and immediate effect on the edema cannot be doubted. The other symptoms disappeared more slowly, the deep reflexes being the last symptoms to clear up.

The evidence that beriberi is a vitamin deficiency disease was emphasized by the marked improvement which followed the replacing of polished rice by wheaten flour.

Recent researches have shown that yeast is more rich in vitamins than any other known substance. Eggs and beans have been much praised by some observers.

*Summary and Conclusions:*

- (1) Beriberi is a disease associated with a diet of polished rice.
- (2) Inability to rise from the squatting position is a symptom which is usually confined to the dry type.
- (3) In coolies who are fed mainly on polished rice, the disease may show itself in from forty to fifty days.
- (4) An important part of treatment consists in discontinuing the polished rice diet, and administering yeast, eggs, beans, and peas, and, in the edematous type, purgatives.

DE F. LANTON.

ELLIOTT, C. A.: A Clinical Study of Yellow Fever. Observations Made in Guayaquil, Ecuador, in 1918. *Archives of Internal Medicine*, Feb., 1920, xxv, No. 2, p. 174.

The author reports a study of about 80 cases of yellow fever. He believes that the mosquito (*Aedes calopus* Meigen) is the chief means of transmission of the disease, but thinks it not unlikely that

direct transdermic infection may occur from infected sores. He states that Noguchi, working in the same group, has isolated from the blood and tissues of these patients a minute organism which could be transmitted to experimental animals, with the production of clinical and pathological manifestations similar to those found in human cases.

Clinically the rapid onset and progress of the disease was striking. The fever was usually low and short, accompanied by bradycardia, congestion of the face, sclera, and gums. Then followed an afebrile period with apparent intoxication, with increasing jaundice, hemorrhage and nephritis. Prompt death or rapid and complete convalescence resulted. The whole course of the disease was short. During the first period of the disease physical examination showed a flushed face and injected conjunctivæ, swollen gums, occasionally herpes, a diffusely tender abdomen, the liver edge being extremely tender, and tenderness to pressure over the flanks. Later the patients appeared weak, dried out and jaundiced. The loss of weight averaged a pound a day.

Jaundice was a constant but variable symptom, appearing generally on the third or fourth day, and was usually proportional to the severity of the disease. It sometimes appeared only during convalescence, and was often the last sign to disappear. The Gmelin test was always positive, and sometimes large quantities of urobilin were found in the urine. No increase in the fragility of the erythrocytes was found. The urine, as a rule, contained large quantities of albumin and many casts, but the blood-pressure was not increased. In fatal cases anuria usually appeared, followed by air hunger, pain in the head, precordium, and back, vomiting, hiccough, delirium, convulsions, coma, and death. The mortality of the series was 38 per cent, which was about the usual death rate from yellow fever in Guayaquil. Postmortem findings were fairly uniform, consisting in diffuse degeneration of all the parenchymatous structures, with numerous hemorrhages in all tissues. The tissues were generally dry and intensely jaundiced. The liver was extremely fatty and showed comparatively few hemorrhages. The kidneys showed extreme tubular degeneration and little or no change in the glomeruli.

T. HOWARD.

ACKERMANN, F. M.: The Specific Treatment of Hay-Fever. *Boston Medical and Surgical Journal*, March 18, 1920, clxxxii, No. 12, p. 295.

The treatment of hay-fever by means of repeated injections of the specific pollens which cause it is a well-established therapeutic procedure yielding satisfactory results. These results are often irregular and by no means perfect. This report is limited to a study of 9 cases caused by the ragweed pollen. In typical cases there are violent sneezing, copious nasal discharge, red running eyes, irritation at the root of the nose, sleepless nights, beginning about August 15th and lasting until the first of October. During the rest of the year the patient is well. In such a case, when ragweed pollen extract is dropped into the conjunctival sac or injected or rubbed into the skin, a typical reaction will follow. The material used in diagnosis and treatment was an extract of ragweed pollen made as follows: 1.0 gram of ragweed pollen added to 100 c.c. of salt solution containing N, 200 NaOH and 0.5 c.c. carbolie acid. This was allowed to stand for three days, with repeated shakings. Then it was filtered through paper and finally through a Berkefeld-N filter. The total nitrogen was found to be 0.2 mg. per cubic centimeter.

In testing patients the intradermal method was used exclusively, the above stock solution being diluted 1 to 10 to make pure pollen 1 to 1000, which is equivalent to 0.02 mg. N. per c.c. The tests were controlled in each case by an injection of carbolized salt solution or of some other pollen extract, such as timothy, or horse hair extract, in order to determine the specificity of the reaction, or whether sensitization is single or multiple.

*Method of Treatment.*—Patients were told to report six weeks before the usual onset of the symptoms. The first dose was 0.05 c.c. of the weak (1-1000) dilution. Succeeding doses, depending upon the local reaction, were given at from five to seven day intervals, and were either double or three times the original dose. The doses were continued until a week after the usual onset of symptoms.

A family history was present in 23 (25 per cent) of the 91 cases studied. The results after treatment were as follows: Eight patients (or 8.7 per cent) were entirely relieved and had no symptoms of hay-fever; 37 (40.9 per cent) were greatly relieved; 20 (22 per cent) showed considerable improvement, i. e., 65 (71.4 per



cent) were definitely improved, 14 (15.4 per cent) showed some relief, while 12 (13.1 per cent) showed no relief or were even worse after treatment.

Of the 91 patients, given on an average 8 injections each, or a total of 728, systemic reactions, which were noticed by both patient and doctor, occurred in 14 instances in 7 patients.

M. M. BANOWITCH.

CADBURY, W. W.: The Pandemic of Influenza as It Affected Canton, China. *Medical Record*, March 6, 1920, xevii, 391.

Cadbury summarizes the pandemic of influenza in Canton, China, as follows:

(1) Three definite epidemics of this disease appeared in that city during the spring, fall and winter of 1918.

(2) These epidemics coincided in time with the appearance of the disease in Europe and America.

(3) Foreigners were but slightly affected in Canton.

(4) The male sex suffered most severely.

(5) At the Christian College the majority of the cases occurred in boys between eleven and twenty years.

(6) The spring epidemic was mild, the fever lasting only from two to four days. The epidemics of the fall and winter were more severe, cases of pneumonia developed, and the elevations of temperature usually lasted from four to five days.

(7) Leukopenia was generally present.

(8) The fever curve often presented two high peaks from twenty-four hours to four days apart.

(9) One attack of the disease appeared to confer immunity against subsequent attacks.

(10) The disease tended to affect all the members of a single household.

(11) The mortality was relatively very low.

The only really effective therapeutic measure in the more serious cases of pneumonia seemed to be the intravenous injection of the blood serum of convalescent influenza patients. Cadbury believes

that putting the patient to bed at once, with careful nursing until he is thoroughly convalescent, is the surest means of warding off pneumonia and death. Although quinin was given in a number of cases, he would not venture to ascribe any specific value to its use.

M. KESCHNER.

STRAUSS, S. G.: Aconite in the Treatment of Epidemic Influenza. *Medical Record*, Nov. 15, 1919, xevi, 798.

Summarizing his experience with 164 consecutive cases of influenza in the United States Naval Hospital in Pelham Bay Park, N. Y., during the influenza pandemic of 1918, the author says:

(1) The tincture of aconite in solution was found to exert a particularly rapid action upon the febrile course of the infection; it brought about a recovery more quickly than did the other usual therapeutic methods.

(2) The relative number of cases developing pneumonia was lower than that among cases treated by other methods.

(3) The pneumonias were, as a whole, milder in their clinical course than those developing in differently treated groups.

(4) In the cases treated with aconite there was a total absence of any complications except the pneumonias.

(5) None of the pneumonias developed a complicating empyema.

(6) Whether the tincture of aconite acts differently when given diluted than it does when given in the usual way, he is not prepared to say, but from his experience he is inclined to believe this to be the case.

Upon admission to the hospital each one of his patients was given  $1\frac{1}{2}$  ounce of castor oil; after the cathartic action of the oil was established each man received the following. Three minims (0.18 c.c.) of tincture of aconite, U. S. P. were mixed with 4 ounces of water. This mixture was given in teaspoonful doses every half hour until the entire solution was used. This was repeated until the temperature was reduced to  $99^{\circ}$  F. ( $37.22^{\circ}$  C.) through the second to the fourth day of the illness, but no patient was allowed to receive more than 9 minims (0.55 c.c.) of the tincture of aconite in

such solution. No other medication was resorted to. The patients were kept in bed for seven days after their temperature remained normal throughout a twenty-four hour period, and were then allowed to be up for a gradually increasing time for three days, and after four more days of full convalescence were discharged from the hospital. In this group of cases there were no deaths from influenza uncomplicated by pneumonia.

M. KESCHNER.

MOURIQUAND ET LAMY: Aseptic Purulent Pleural Effusions in Children. *Proceedings of the Société Médicale des Hôpitaux de Paris*, Mar. 9, 1920. Reviewed in *La Presse Médicale*, April 3, 1920, xxviii, No. 19, p. 188

It is not rare to find a pleural effusion in children ill with pneumonia. Exceptionally, this fluid is of the aseptic, purulent type.

The laboratory is not essential in establishing the diagnosis of the presence of an aseptic purulent effusion. Physical examination, alone, will show sufficient signs on which to base the diagnosis.

In practice, not every purulent effusion should be considered a surgical condition. It is wise to temporize for a few days, in order that the progress of the case can be observed, and in order that no unnecessary surgery be employed.

S. KAHN.

SEWALL, H.: Occult Tuberculosis. *American Review of Tuberculosis*, Jan., 1920, iii, No. 11, p. 665.

By this term the author means to convey the idea of a prodromal period of symptomatic disorder in subjects who suffer from tuberculous intoxication, but who do not present signs of clinical tuberculosis. The functional impairment of the living mechanism is a result that should be expected from the metabolism of the tubercle bacilli, preceding the recognizable structural tissue changes incident to their multiplication. A so-called "focal infection" with its nidus of streptococci, or other bacteria, may imitate indistinguishably the symptoms of the active tuberculous infection.



The main problem is to develop a clinical technic by which pathological functional deterioration may be recognized with certainty. There is a vital mechanism which is open, within limits, to exact investigation by simple apparatus, namely, the circulating blood studied through observations of the arterial blood-pressure, and leading to deductions concerning the efficiency of the cardiac function and vasomotor tone. In the healthy young adult the systolic blood-pressure should register between 115 and 130. A figure of 100 or less indicates deficient driving power for the blood. A pulse-pressure under 30 mm. Hg. is a sign of the deficiency in the pulse-wave, and when it drops to 20 or 12 mm. Hg. morbid symptoms are usually apparent. When the blood-pressure is measured by the auscultatory method and checked by the tactile observation of the radial pulse, two different manifestations of vasomotor weakness may be apprehended. The first consists in an untoward fall in systolic pressure when the patient assumes the standing posture. The blood-pressure measured in the recumbent position may present nothing abnormal except a more or less marked hypotension, but when the patient stands the systolic pressure soon begins to fall and sometimes falls progressively until the observation must be broken off lest the patient succumb to faintness. A fall of from 10 to 20 mm. Hg. on change from the recumbent to the standing posture is distinctly pathological. General bodily weakness depends not so much upon the fall in systolic blood-pressure as upon diminution in pulse-pressure. Cases showing symptoms of circulatory asthenia, all exhibiting subnormal pulse-pressure, much more frequently suffer their deficiency in pulse-pressure through rise of diastolic pressure alone than through fall of systolic pressure alone. The pathology of postural systolic pressure is due to lack of vascular tone, and an inordinate rise in diastolic pressure signifies vascular spasm and cardiac insufficiency.

Another special evidence of vascular weakness is an extraordinary rhythmic fluctuation in the height of the systolic blood-pressure; in inspiration it is markedly lower than in expiration, but the great pressure undulations cover the period of several or even many inspiratory movements. These undulations are not specific of occult tuberculosis, but they are an evidence of asthenia, the source of which must be traced along these lines.

The next source of evidence is the auscultation of the lungs and important area in the back of the chest from the level of the lung

roots upward. The most distinctive sign of intense congestion or increased density is the change in the quality of the transmitted sound. The upper partials of the voice are relatively strengthened, and we have a vocal expression characterized as "bronchophony" but of distinctly higher pitch than is the case in the normal subject. An important and more advanced sign of structural change is the lingering of the spoken sound in something of an echo; as d'Espine has pointed out it occurs in bronchial adenopathy of children.

There may be no demonstrable percussion dullness, or change in the respiratory murmur or muscular tension of the affected apex; still less are there adventitious sounds or râles.

The next points in evidence are the *x*-ray findings. The changes are, for the most part, to be found in the glands and in the bronchial trees. The root shadows are abnormally voluminous; the areas of condensation, defined as glands, are conspicuous; dense shadows suggesting calcification are apt to be found. Dense deposits of greater or less magnitude may mark the course of the radiations. The bronchi of the inspected region are marked by irregular thickening, producing inequalities of shadow along the course of the radiations.

*Symptoms.*—The outstanding symptoms are nervousness, neuromuscular asthenia, easy nervous exhaustion, instability of will, undue fatigue at the end of the day and, in women, scanty or missed menstruation. The intoxication is not manifested by pulmonary signs and symptoms, but by insufficiency of one or more of the vital organs, especially those of internal secretion. In persons of this class deficiency in the secretions of the pituitary, adrenal and thyroid glands is strongly indicated by their evident clinical improvement under the administration of appropriate gland products. The most common functional deficiency is that of the organs of circulation. The fundamental sign of functional insufficiency is the critical lowering of the pulse-pressure under the hydrostatic strain of erect posture.

C. A. SCHMID.

BIESENTHAL, M.: Therapy of Pulmonary Tuberculosis. *International Medical Clinics*, 1920, i, 30th series, p. 9.

This paper is a report of a lecture given by Dr. Max Biesenthal before the internes of the Cook County Hospital in Chicago, Ill., and

although the author presents nothing new, the lecture is abstracted because it is an excellent, common sense, résumé of the modern method of treating pulmonary tuberculosis.

The first problem considered by the author is the question of prophylaxis. "In this problem," he says, "we are guided to-day by two principles. First, there is a universal belief that tuberculosis is acquired early in childhood and second, that as a clinical manifestation of adult life it is simply the awakening of the so-called childhood infection."

It is of the greatest importance that we should not allow the dissemination of tuberculous sputum in the vicinity of children, because it has been definitely established that a child at the age of six months or one year coming in contact with a parent, nurse or relative afflicted with tuberculosis, has one chance out of ten of escaping a very early death from some form of tuberculous infection. A young child thus exposed to a large dose of tubercle bacilli has not the resistance to withstand the toxin; it has not the ability to form the antibodies needed, and therefore dies.

The future possibility in prophylaxis, therefore, depends upon two methods: (1) prevention of the dissemination of sputum, and (2) improvement of certain conditions of the adult, which will be an effort toward eradicating the clinical disease.

It is well known that tuberculosis is not a hereditary disease; the actual transmission of the clinical disease from the parents to the new-born infant has probably not been recorded in medical literature more than half a dozen times, and even these cases are questionable. But there are two factors in this connection, which cannot be controverted. The first is the transmission of the disease from the mother or father to the infant, the second, the transmission from the mother or father of an inherited weakness and lack of resistance, which makes it impossible for that offspring to withstand the many diseases with which it may come in contact, as the days go on.

Bearing these facts in mind the question of marriage assumes an important rôle in connection with the prophylaxis and treatment of tuberculosis. This question, however, is closely interwoven with the question of disseminating the disease by the formation or transformation of what is known to be a latent or inactive case of tuberculosis into an active one. The latter question has its greatest bearing on the problem of tuberculosis in women when the question of marriage



arises. It was formerly thought that pregnancy was beneficial to women afflicted with tuberculosis. While it is true that a woman, during her pregnancy, does improve as far as her general condition is concerned, it is nevertheless a fact that as soon as the baby is born, the disease lying dormant during the period of gestation awakens as an acute form and proves fatal to the mother. Therefore, as far as prevention of clinical tuberculosis is concerned, we can prevent that disease by giving proper advice about marriage to individuals, especially to women, when we know them to be actually tuberculous.

Biesenthal next takes up the actual treatment of the disease. First he discusses the matter of personal cleanliness. There is no reason why a patient with pulmonary tuberculosis, unless he is bedridden, should not be compelled to take a weekly, biweekly, or even triweekly bath, provided the water is not too hot. He is, however, opposed to these patients taking Turkish or Russian baths. The next danger on which he lays stress, is that of the patients swallowing their sputum. It is to this swallowing of sputum that a considerable number of the gastro-enteric complications, which arise sooner or later, may be attributed.

The author knows of no other condition in the domain of internal medicine which requires more tact, more talking and more lying, at times, than does the handling of a case of pulmonary tuberculosis. The physician who can handle a patient and inspire his confidence at any and all times is the man who has the greatest success in the treatment of these patients. The patients must be impressed with the fact that tuberculosis is a disease, and like many other diseases requires treatment, and that with reasonable care and ordinary intelligence they will get well. The moment that these patients conceive the idea that they are going to die, they do die. Fortunately, the majority of the cases are of the hopeful type, always feeling that they are going to get well. At all times, however, the members of the family who are most interested in the patient must be informed of the exact truth as to the conditions at hand.

The question of exercise in the treatment of pulmonary tuberculosis has always been a debatable one. Some clinicians have been utterly opposed to any form of exercise. Others follow the lead of Patterson of England (cited by the author) who put his sanatorium patients through certain forms of graduated exercise, with good results. After his work was announced to the world all sanatoria

began to swing about to the other extreme, and many a patient was hurried to his grave simply by overexercising when he should have been at rest. Before the war, Biesenthal was observing a happy medium in the way of exercise. His fever patients were kept flat on their backs in bed. The patients who had a normal temperature in the morning were allowed a very small amount of exercise and were gradually worked up to such a degree of strength that they could do a fair day's work. As a result of experience gained in the war, it was learned that a certain group of patients who had previously been kept absolutely at full rest could do a certain type of work, with marked benefit to their general condition. This led to the evolution of so-called occupational therapy in tuberculosis.

The patients were given only light work, such as a little bead work or basket work or knitting, or some such form of exercise. They were permitted to work five minutes and then to rest and probably to work an hour or an hour and a half a day. It was found that after this mild or light form of exercise the temperature became lower, the pulse of better force and rate, and the patient's general condition markedly improved. Biesenthal holds that it was not exercise which accomplished this. It was purely psychic, because the patients who believed that they were through with life began to feel that they had obtained a "new hold on things."

It was from this light form of exercise that occupational training was developed. Young girls are now taught stenography, domestic science, etc., during certain parts of the day, the men are taught telegraphy, automobile repair work, carpentry, printing, etc. They can utilize this training as a form of occupation after they leave the hospital.

The author thinks that overfeeding tuberculous patients is criminal. He does not believe in fattening them and allowing the disease to progress, but finds that most of the patients get along best on three meals a day. His patients live on a regular family diet consisting of meat, potatoes, butter, and vegetables. The food must not be highly seasoned, and substances containing a large amount of vinegar are forbidden. He finds that sour foods act injuriously in tuberculous cases, although many patients seem to crave for something sour very frequently.

When the diagnosis of incipient tuberculosis with positive sputum is established in the case of a man or woman in whose family there

is a young infant, that infant must be kept away from the source of infection. Practically speaking, this means that the patient must be sent away. The decision as to where to send such an individual depends not only upon the medical aspect of the case, but also upon the social and financial condition of the patient. Each case presents an individual problem in this respect.

Patients with moderately advanced disease and fairly active lesions and fever, if they have a tolerably good home and if there are no children in the family, get along as well at home as in any institution. Unfortunately the number of people who can adhere to the rigid régime necessary for them to recover while living at home, is small, so that most of these patients must be sent to a sanitarium not so much for a "cure" as for "education." A sanitarium shows the patient that there are others who have the same disease and teaches him everything that he will need after he leaves the sanitarium and returns home. It is in this respect, the author believes, that the tuberculosis sanitarium has its greatest value.

Aside from the problem of segregation of cases to prevent the spread of the infection among children, a far advanced case, irrespective of the financial problem, is never to be sent to the West. A patient with active symptoms, high temperature and rapid pulse, will die sooner as a result of the trip than he would if he had remained at home or in a local institution.

An incipient case requires from six months to a year for recovery. This is an important factor, so far as the patient's financial condition is concerned, in determining whether he is to be sent to Colorado, New Mexico or California. Patients must be financially so situated that they can stay away at least a year without worrying about their maintenance or the financial condition of the other members of the family at home.

The author next takes up the medicinal treatment of pulmonary tuberculosis. As far as he knows there is no specific treatment for the disease. Tuberculin in pulmonary tuberculosis, he insists, is valueless; if anything, it frequently aids in the production of hemorrhages and helps to place the patient on the downward path.

From time immemorial various drugs have been announced as positive cures for tuberculosis. The strange thing about the drug therapy of tuberculosis is, that if one goes to a sanitarium and tells the patients that one has a new cure for tuberculosis, it makes no



difference what it is, they begin to use that drug, and immediately a large number of patients begin to improve. This is due to the psychic element peculiar to patients afflicted with tuberculosis. The three remedies, the reputation of whose durative effects in this disease have survived all others, are: creosote, cod liver oil, and iodids. The author condemns the use of all of them and especially of the iodids. The latter have, next to tuberculin, activated more inactive cases than any other remedy. Biesenthal uses drugs only to treat symptoms.

For the treatment of cough, he finds guaiacol albuminate more helpful than any of the opiates or their derivatives, and it has the advantage of not inducing narcotic habituation. Sometimes he finds the bromids to be very beneficial. Simple education, such as asking the patient not to cough, will, according to the author, aid more than will any of the narcotics.

The treatment of pain in tuberculosis is an important matter. In practically every case of tuberculosis of long duration there is some pleurisy, usually of the adhesive type, and each time the weather changes, each time there is a little additional exertion, or occasionally without any discoverable cause, these patients complain of pain. In the treatment of this symptom, Biesenthal finds one of the three methods: talking to the patients, applying iodine externally, and strapping, far superior to the method of giving  $\frac{1}{4}$  of a grain (0.016 gram) of morphin hypodermically.

For night sweats he uses  $\frac{1}{100}$  grain (0.0006 gram) of atropin at bedtime. Sometimes two or three tablets on three successive nights cause the night sweats to disappear; or they may disappear for four or five days, only to return. He also employs agaricin,  $\frac{1}{6}$  of a grain (0.01 gram) and camphoric acid in doses of 15 minims (0.92 c.c.). At times, nothing will help; he then stops all drugs, and attempts to determine the time at which the patient sweats; he wakes him up previous to sweating, gives him a hot drink and a sponge bath, and the sweats disappear; this is probably due to the change in the routine of the patient's sleeping and waking.

In the minds of the public, a hemorrhage in a tuberculous patient always means death. As a matter of fact, according to the author, statistics show that only about two, out of every hundred of the patients who have a hemorrhage, die as a result of the hemorrhage. He never permits the use of morphin in this condition. He uses

*moral suasion*, and ice to the chest. In small hemorrhages he employs about  $\frac{3}{4}$  of a grain (0.048 gram) of emetin hydrochlorid, repeated three or four times a day; in large hemorrhages the best remedy is horse serum. When the patient's condition is very critical he pays no attention to the question of the anaphylactic action of the horse serum.

There is no other complication of tuberculosis that will kill a patient as quickly as diarrhea. For this the author advises large doses of paregoric with a drop or two of creosote in each dose (of paregoric). "Here," Biesenthal says, "is one place where creosote seems to have almost a selective action when coupled with other drugs."

The author has never seen a case of tuberculous laryngitis cured by treatment, be it with sprays, mirrors, drugs, etc. In the cases with this complication in which recovery ensues, this occurs as a result of the general improvement of the patient. He advises ordinary treatment of rest, fresh air, diet, with medication to aid swallowing, such as a cocain spray.

The use of *x*-rays as a therapeutic measure in pulmonary tuberculosis is mentioned by the author only to be condemned. He has no statistics to prove or disprove the value of radium. As to artificial heliotherapy, he states that up to the present time he has never seen any result comparable with either the price of the machine or the time one spends on the work. The results of Rollier's method of exposing portions of the body to sunlight for periods of time, gradually increasing the periods as the patient becomes accustomed to the sun's rays, have not been very encouraging in the pulmonary type of the disease.

Most radical surgical measures such as resection of ribs, and plastic operations, etc., in the treatment of pulmonary tuberculosis are never heard of anymore. No patient ever lived long enough after one of these severe operations to see whether it would do any good. There is only one operation which has done a certain amount of good and that is the induction of artificial pneumothorax, a method of immobilizing the diseased lung by the injection through a needle of either air or nitrogen gas.

Artificial pneumothorax is indicated: (1) in cases of unilateral involvement; (2) if the disease is bilateral, but inactive on one side; (3) when the patient is not desperately ill; (4) in young individuals

and (5) if it can be decided from which lung the patient is having a hemorrhage. In the latter case artificial pneumothorax is the treatment *par excellence*. Contra-indications are: (1) renal involvement, (2) diabetes, (3) laryngeal involvement, and (4) age beyond a certain limit. Performed properly in a proper case, it prolongs life, and alleviates cough, fever, excessive expectoration and stops hemorrhage—but it is not a cure.

M. KESCHNER.

SAVAGE, W. G.: Housing Problems in Rural Districts. *The Journal of State Medicine*, Nov., 1919, xxvii, No. 11, p. 327.

The standard of quality of housing conditions has always been low and the number of houses too small, with consequent overcrowding. The agricultural laborers have larger families, hence less money for rent. A man may have an inconvenient, dilapidated, unfit, or too small house but he can change it only with difficulty, because by complaining to the landlord he runs the risk of losing his job. The worst cases of overcrowding are in the country.

The commonest defects of old cottages are dampness and insufficient light and ventilation. Many cottages are without a pure and sufficient water supply and the arrangements for the disposal of excreta are often most unsatisfactory. Baths are almost invariably absent. Open fireplaces are often the only provision for cooking; there are no means for washing clothes; there is often no pantry. Water has to be hauled from a surface well for some distance. The toilet, even if sanitary, may be a long way from the house and shared among several cottagers.

The present shortage of houses must be met by the construction of new cottages, and gradually the defective ones must be destroyed or altered to bring them to a standard of decency.

At present the needs of each parish are being estimated, based upon (1) natural increase, (2) accommodations for more laborers where more land is tilled, (3) replacement of unfit houses.

It is a lengthy and troublesome process to find the number and location of the unfit houses. A statutory definition of unfitness is not practicable, and people do not agree. It is essential to consider



all the defects together in a questionable case, as the trouble lies in the cumulative effect of a number of defects. Every local housing authority should divide the houses into three groups:

(a) Those which are unfit for habitation and which cannot be made so with a reasonable expenditure.

(b) Those which are defective but not unfit and which can be made reasonably fit.

(c) Those which are in good condition and only need attention to minor matters.

The government is building new houses and the question of the rents to be charged comes up.

At present the restrictive acts prevent an increase of rent, but when they are withdrawn a widespread increase is likely. The following scheme is suggested:

(a) Where the houses are passed as fully satisfactory, the landlord may charge any rent obtainable.

(b) Where the houses are in good condition, but not up to the modern standard, *i. e.*, where they are not legally "unfit for habitation," but could be improved by expenditure, the landlord may be allowed some definite increase in rent.

(c) Where the houses are structurally defective, or of very poor quality, and their occupation is only permitted because of the existing scarcity or because they are suitable for old single couples, etc., no increase of rent should be allowed, apart from that necessary to cover the cost of the prescribed works.

Houses classed in a lower grade could be transferred to a higher one if the work done to improve them justified it.

The nation needs to have a larger proportion of its population in the country, and to keep it there. Better wages and houses are effective for this purpose, but village life must also be made more attractive. The solution of the rural housing problem is troublesome and costly but worth while.

P. L. DU BOIS.

DAVY, SIR H.: Some War Diseases. *British Medical Journal* Dec. 27, 1919, ii, No. 3078, p. 837.

With the exception of trench fever, no new disease was discovered during the war, but much was learned as to the history and treatment of some conditions.

The psychoneuroses did not differ from those of civil life, but were more frequent. The best treatment was found to consist in institutional care, where the atmosphere is one of expectant cure, suggestion, graduated employment and reëducation, and a stay in the institution until the nervous mechanism was stabilized.

The great lesson learned in disordered heart action was not only the value of rest, but the necessity for graduated exercise in treatment.

In lung diseases the importance of relying upon bacteriological findings must be emphasized, also the necessity for intelligent treatment of these cases, and the fact that often the symptoms of pneumonic infections are altered by the failure of the kidneys to do their work.

The conclusion is that war nephritis does not differ either in origin or in treatment from that found in civil practice.

L. C. JOHNSON.

COTTON, T. F.: Observations on Mitral Stenosis in Soldiers. *British Medical Journal*, Dec. 27, 1919, ii, No. 3078, p. 840.

At no time in the past has it been possible to observe so many cases of early organic heart affections in the wards of a hospital. Mitral stenosis, whether early or developed, is a valvular defect which develops slowly, and signifies a structural lesion of the heart. From observations on 42 men who had unmistakable signs of mitral stenosis, but who had had no difficulty during training, or long active service, the author concludes that mitral stenosis may present no symptoms, and permits a good deal of exercise. If there are signs of cardiac failure, however, the patients will always show a poor exercise tolerance. The increase in pulse-rate is a useful sign in estimating exercise tolerance in mitral stenosis, but it is not a guide in distinguishing between early and developed signs. When there is

an equal degree of distress after exercise, the pulse-rates rise to the same level in cases with early mitral stenosis, and D. A. H. (disturbed action of the heart, or so-called "functional" disturbances—Abstr.). The diagnosis of early mitral stenosis in the absence of a diastolic rumble is not accurate. If exercise raises the pulse-rate to 140, and there is still no diastolic murmur, there is no narrowing of the mitral orifice. The same procedure should be adopted in searching for a thrill. A murmur and thrill which are brought about by exercise, or by change in position, with or without cardiac enlargement, denote early mitral stenosis. When the murmur is present at all times, standing or lying, or when the thrill is felt in one or more positions, it is safe to diagnose the condition as one of developed mitral stenosis. As the disease progresses, the full pulsating veins of the neck are evident with the patient lying flat, and do not collapse when the head is raised above the level of the thorax. The ears and lips are cyanosed, the liver is palpable and tender.

Cardiac enlargement is one of the most important signs of myocardial mischief, and the left border of dullness as determined by palpation and percussion is the best index of this enlargement. It is generally safe to consider that the whole heart is enlarged, when there is enlargement to the left. The exercise test indicates the present status of the individual, but is not to be relied upon in predicting the duration of life. The course of the disease is a progressive one, the disability increasing, and heart-failure the end of most of these cases. If the heart is much enlarged the onset of heart-failure is probably not far distant.

L. C. JOHNSON.

MURLIN, J. R.: What We Have Learned in Dietetics from the Army. *The Modern Hospital*. Jan., 1920, xiv, No. 1. p. 58.

In every previous war the army has been subjected to some form of nutritional privation. In the Revolutionary War there was not enough food to go around. In the War of 1812 the contract system with its evils of swindling, together with lack of knowledge of foods, gave rise to scurvy. During the Mexican War the army lived on the food of the country where it was operating, and the wine and



fresh fruit prevented scurvy to a great extent. There was much dysentery, however.

It was not until 1863, in the Civil War, that the Medical Department was given control of the diet of the soldiers among whom scurvy was common. The embalmed beef scandal of the Spanish-American War is well remembered by many. The canned food processed for use in a northern climate spoiled easily in the semitropical climate of Florida and Cuba. Typhoid fever was the curse of this campaign, and it was seen that a supervision of camp conditions in general, together with adequate inspection of foods, not only when purchased, but at the mess before they were used by the cook, was imperative. As a result General Gorgas organized the Division of Food and Nutrition.

When we entered the Great War the basal ration of 18 ounces of bread and 20 ounces of meat was excessive. It dated back to 1794 when whiskey was served with it. In 1818 half a pint of beans had been added and the whiskey replaced by molasses for the making of spruce beer. In 1832 tea and coffee were substituted for liquors. Later potatoes and tomatoes were added, then prunes, evaporated milk, butter and lard.

No man can eat the entire army ration day in and day out. It was found that the average amount of meat eaten in the training camps was 13.5 ounces instead of the 20 ounces provided, 7 ounces of bread instead of 18, 13 ounces of potatoes instead of 16 ounces. When the soldier had free choice he ate more beans, fruit, milk, butter, and drank more coffee seasoned with more sugar than the ration prescribed. Therefore the ration should be revised in these directions. This could have been done a year and a half ago with a saving of three cents a day for each soldier—no small sum of money with an army of 4,000,000 men.

The men, except in circumstances of extraordinary emergency in the line of duty, have always had enough to eat and food of such a quality that no cases of deficiency disease have been reported, and only a few cases of any other disease traceable in any way to food.

For the first time we now know:

- (1) The average requirement for the soldier in training, and the range of requirement, so that an average daily ration can now be estimated.

- (2) The average composition of the food eaten in mess.
- (3) The variation in food consumption in different seasons of the year, in different messes doing the same physical work. Here the variation depends upon the psychology rather than upon the physiology of the mess.
- (4) The average consumption by different classes of patients in army hospitals.
- (5) The preponderance of acid ash in the ration, as prescribed and eaten, with the accompanying danger, in combination with excessive muscular fatigue, of an accumulation of acid.
- (6) That a corrective diet prescribed by the hospital surgeon has nearly always a basic ash.
- (7) That there is a possible relationship between diet and susceptibility to infection which must be studied further.

B. v. H. ANTHONY.

BLUMGARTEN, A. S.: Vagotonia and Sympathicotonia as Aids in the Diagnosis and Treatment of Endocrine Conditions. *The Medical Clinics of North America*, Sept., 1919, iii, No. 2, p. 473.

Clinical observations in the diagnosis of endocrine lesions must be more thorough, and should be based on the occurrence of a certain definite clinical syndrome which appears when the function of the glands is disturbed. Hypo- and hyperfunction cause disturbances manifested in the body growth and development, in the metabolism, and in the peripheral and the central nervous system.

Endocrine glands sensitize the peripheral and the central nervous system. Thus an excess of adrenalin sensitizes the sympathetic nervous system, the change being manifested clinically by a characteristic group of symptoms called sympathicotonia. When the injection of a small dose of adrenalin causes symptoms of hypersensitivity, it is assumed that an excessive amount of adrenal secretion is present in the blood. Eppinger and Hess have shown that certain individuals suffer from symptoms, as a result of excessive peripheral sensitization of the autonomic or vagotonic system (the vagus, motor oculi and hypoglossæ); the syndrome produced is known as vago-

tonia. This is believed to be the result of disturbed function of one or more of the endocrine glands (thyroid, thymus). An artificial vagotonia may be produced by an injection of pilocarpin. When a small or usual dose of this produces pronounced symptoms of vagotonia it may be assumed that an endocrine disturbance characterized by vagotonia exists.

An individual may show symptoms of the autonomic system at one time, and subsequently symptoms of the sympathetic nervous system. This is due to the compensation of the reciprocal gland.

In normal individuals a normal constant balance exists between the vagotonic and sympathetic systems.

Several cases of exophthalmic goiter are given, showing the importance of vagotonia and sympathicotonia in modifying the treatment. Exophthalmic goiter may be divided into several groups. The usual cases manifest both sympathicotonia and vagotonic phenomena, while in other cases either one or the other is present. When, for instance, the sympathicotonic symptoms predominate an exaggerated state of vagotonia may be produced by pilocarpin, which neutralizes the sympathicotonia. A case with vagotonia may be treated with atropin to lessen the vagotonia, or compensated by causing an exaggerated state of sympathicotonia by the use of adrenalin.

II. WOLFER.

DOPTER: Increased Sugar Content of the Cerebrospinal Fluid in Encephalitis Lethargica. Proceedings of the *Académie de Médecine de Paris*, February 24, 1920. Reviewed in *La Presse Médicale*, Mar. 27, 1920, xxviii, No. 17, p. 161.

In many examinations of the cerebrospinal fluid of patients ill with lethargic encephalitis, Dopter found an almost constant increase in the sugar content. Netter, also, has confirmed this finding.

This finding serves as a good differential diagnostic point between this disease and others for which it may be mistaken.

S. KAHN.



## SECTION ON

### LABORATORY AND RESEARCH

YOUNG, H. C., AND GIVLER, J. P.: A Comparison of Certain Antigens Used in the Complement-fixation Tests of Pulmonary Tuberculosis. *The American Review of Tuberculosis*, Oct., 1919, iii, No. 8, p. 476.

There are innumerable points that might be and have been discussed in connection with complement-fixation for tuberculosis, the technic, and especially the antigens. The technic needs little comment, as it has been fully discussed by able investigators, and precautions have been clearly pointed out. Without the conception of the chemistry of the tubercle bacillus being clear, bacillary emulsions have often been suggested and their value as antigens extolled, but their advantages over a simple bacillary emulsion have not been made clear. In this class is the Wilson antigen. The alcoholic extraction removes both the fatty and the protein extractives, and since this extraction is crude, at best, it is natural that antigenic material should remain with the bacilli. Complete extraction, however, removes all antigenic substances, as expected. We are arriving at a point where a new antigen should have a scientific basis to justify its introduction.

The following results were obtained with the serums of 97 clinically normal individuals, 37 questionably tuberculous, 84 incipient, 75 moderately advanced, and 31 far advanced cases of pulmonary tuberculosis, using for comparison the autolysate antigen of Corper, the methyl alcohol soluble antigen of Petroff and the Wilson bacillary emulsion:

The three antigens did not differ greatly in the percentage of positive findings from that in known cases of pulmonary tuberculosis, Petroff's antigen giving 66 per cent, the autolysate antigen,

63 per cent, and Wilson's antigen, 57 per cent, the last being the least efficient of the three.

The percentage of positive findings obtained in the various classes of cases by the three antigens were: 11 per cent of the clinically normal individuals, 58 per cent of the questionably tuberculous, 56 per cent of the incipient, 64 per cent (66 per cent sputum positive cases) of the moderately advanced, and 71 per cent of the far advanced cases. Moribund cases gave a lower percentage positive, (44 per cent), than any other of the definitely positive cases of tuberculosis, corroborating the findings of previous investigators.

A fairly high percentage of serologically positive luetic serums (from 50 to 60 per cent) gave cross fixation with the three tuberculous antigens. The serum of only 1 out of 7 guinea pigs (of a total of 75) obtained on the market proved unsuitable for complement-fixation tests for syphilis and tuberculosis, corroborating the findings of the earlier investigators, and not bearing out Von Wedel's contention. The human hemolytic system is superior to the sheep system as ordinarily used in testing serums from cases of pulmonary tuberculosis. The native sheep hemolysins in the serum deteriorate to a great extent in a week.

C. A. SCHMID.

BROWN, J. H.: The Cultural Differentiation of Beta Hemolytic Streptococci of Human and Bovine Origin. *The Journal of Experimental Medicine*, Jan. 1, 1920, xxxi, No. 1, p. 35.

Hemolytic streptococci are common in good dairy products, and are usually harmless to the consumer. It is desirable to be able to distinguish such streptococci from the hemolytic streptococci pathogenic to man which are sometimes found to be in dairy products.

In differentiating the types, the author studies the agglutination titer against immune serum, the rapidity with which hemolysis occurs, the size of the hemolytic zone on a blood-agar plate, the rate of coagulation of milk, the degree of acidity produced in carbohydrate media, and the action of a bouillon culture on blood-corpuscles in suspension.

H. M. FEINBLATT.

EMERSON, C.: The Preservative for Wassermann Reagents (Chloroform the Best Preservative). *The Journal of Laboratory and Clinical Medicine*, Oct., 1919, v, No. 1, p. 62.

The alcoholic extract of antigen keeps indefinitely. Red blood-cells may be serviceable up to one week after collecting if sedimented in salt solution and kept in the ice-box. Complementary serum must not be over four days old and must be kept in the ice-box. The amboceptor, suspected sera, and control sera are much better preserved and are active for a greater period of time if a few drops of chloroform are added as a preservative. No test is of certain value if performed on sera kept in contact with the clot longer than twenty-four hours.

C. M. ANDERSON.

BARBER, M. A.: Antiblastic Phenomena in Active Acquired Immunity and in Natural Immunity to Pneumococcus. *The Journal of Experimental Medicine*, Dec. 1, 1919, xxx, No. 6, p. 589.

The author considered it important to exclude the possibility that while no inhibiting action by serum can be demonstrated, the whole blood when freshly drawn from the actively immunized animal may have an effect of this kind. It seemed possible that the so-called antiblastic immunity might play a part in active immunity. A series of experiments were undertaken to determine whether or not blood fresh from the immune horse had any effect on the growth rate of the pneumococcus. A virulent strain of type II was used. The technic employed is that devised by the author and consists in the isolation of single bacteria and their growth in hanging drops. They conclude that whole fresh blood-coagulated plasma, or serum of the immunized horse added directly to pneumococci, has considerable inhibiting action on their growth. This inhibiting action, however, is not as marked as that of a serum from a horse highly immunized to the same type of pneumococcus. It has been impossible to demonstrate that antiblastic phenomena play any part in natural immunity to pneumococcus (Pigeon).

H. M. FEINBLATT.



BLOOMFIELD, A. L.: The Fate of Bacteria Introduced Into the Upper Air Passages. *Bulletin of the Johns Hopkins Hospital*, Nov., 1919, xxx, No. 345, p. 317.

The author carried out a number of bacteriological studies designed to determine the fate of bacteria introduced into the nose and mouth of human beings. For this purpose he chose a *Sarcina lutea*, as being non-pathogenic, not normally present in the upper air passages of man, easily recognized, and not easily overgrown by the normal mouth flora. It was found that even a short period of time after these organisms had been swabbed in large amounts on the tongue and nasal mucosa, and into the crypts of the tonsils, it was usually impossible to recover them. Disappearance from the nose was somewhat slower than from the other sites. In only one instance could any organisms be recovered after twenty-four hours, and in no case after two days. Cultures made in this way do not prove the complete absence of the organism, but the general trend of the quantitative relations indicates a rapid disappearance. Possible factors active in causing their disappearance from the mouth were considered. Mechanical cleansing by thorough and extensive irrigation was found to exert very little influence. The action of the normal mouth flora was excluded by growing the sarcinae very successfully with a suspension of these organisms. Finally it was found that the saliva and mouth secretions exert a very prompt and marked bactericidal effect, as far as these organisms are concerned.

T. HOWARD.

MELLON, R. H.: A Contribution to the Bacteriology of a Fusospirillary Organism, with Specific Reference to Its Life History. *Journal of Bacteriology*, 1919, iv, No. 5, pp. 505-538.

A fusospirillary organism was isolated from a case in which it caused general infection, the point of origin being in the appendix. It displayed branching filamentous forms which relate it to the higher bacteria (*Streptothrices*), and bacillary and coccoid forms which relate it to the lower bacteria. It was not possible to cultivate the filamentous forms from the material from the renal abscess or the lung puncture, although they could be demonstrated on smears from

both locations. They were cultivated from the blood cultures. This was due partly to an irregularity in the preparation of the media and partly to a radical change in environment. The author does not regard these changes as mutation changes or as a function of the environment, but as intrinsically a function of the particular organism. Cyclic changes from one form to another have been repeated many times, but it has never been possible to repeat the process in exactly the same way.

F. HULTON-FRANKEL.

WALKER, I. C., AND ADKINSON, J.: Types of Streptococci Found in the Sputum of Bronchial Asthmatics. *Journal of Medical Research*, July, 1919, xl, No. 2, p. 229.

The authors studied 65 different specimens from 50 individuals. Hemolytic streptococci were recovered from 46 of the 50 patients, and in 35 of the 65 sputa this type predominated, while in one it was in pure culture. Non-hemolytic streptococci were recovered in 37 of the 50 patients, predominating in 24 of the 65 sputa, and appearing in pure culture once. In 3 specimens the hemolytic and non-hemolytic strains were present in about equal numbers and in one only was no streptococcus found. In this instance the *Staphylococcus pyogenes aureus* was the only organism found.

The streptococci were classified according to their ability to produce fermentation with the three sugars, salicin, mannite, and lactose, according to the method of Holman. It was found that practically all the hemolytic streptococci were included in the four types, *subacidus*, *anginosus*, *pyogenes*, and *infrequens*, while practically all the non-hemolytic streptococci belonged to either the *ignavus*, *salivarius*, *mitis*, or *non-hemolyticus I*. It was suggested that in doing the skin tests it would be well to include the protein of these types rather than the protein of one type alone. Autogenous vaccines were commended, but it was remarked that they should be made at frequent intervals, since the types of organisms present in the sputum are not constant, and therefore there is a chance that some vaccines may not contain the particular organism which is causing symptoms.

T. HOWARD.

SELLARDS, A. W., AND STURM, E.: The Occurrence of the Pfeiffer Bacillus in Measles. *Bulletin of the Johns Hopkins Hospital*, Nov., 1919, xxx, No. 345, p. 331.

The examination of a group of measles cases occurring at Camp Devon a few weeks after an epidemic of influenza showed the presence of an organism indistinguishable from the Pfeiffer bacillus in 25 out of 31 cases. This organism was readily obtained from the sputum, and also from the conjunctiva. A highly parasitic hemoglobin-requiring organism was obtained in 1 of 2 cases from an excised inguinal gland. The Pfeiffer organism was not obtained from the blood stream nor from the excised skin lesions. With the subsidence of the active symptoms of measles these microorganisms disappeared rather rapidly in about three-fourths of the cases. Cultures of the Pfeiffer organism from cases of measles failed to colonize when inoculated on the mucous membrane of 4 healthy volunteers. Two of these individuals had not, to their knowledge, had measles or influenza. A comparison was made of the strains of the Pfeiffer bacillus isolated from measles and from influenza. The results showed considerable variation in the behavior of the individual strains. It is theoretically possible that the hemoglobin-requiring bacilli represent a group of organisms containing different species. The occurrence of the Pfeiffer bacillus in both measles and influenza constitutes suggestive evidence against its etiological relationship to either disease. This evidence would be materially strengthened provided the identity of the strains from these two sources were accurately established. The evidence which is available at present is not sufficiently complete to exclude the specific etiological rôle of the Pfeiffer bacillus in some of the acute respiratory diseases.

T. HOWARD.

HEIST, G. D., AND SOLIS-COHEN, S.: The Bactericidal Action of the Whole Blood of Rabbits Following Inoculations of Pneumococcus Bacterins. *Journal of Immunology*, July, 1919, iv, No. 4, p. 147.

The essential feature of the method is that a capillary glass tube is filled by capillary attraction up to a fixed mark with broth culture



of pneumococci, and then emptied. A certain number of pneumococci remain sticking to the wall of the tube. Blood, as it comes from capillary or vein, is allowed to flow up the tube to the mark and the tube is then sealed and incubated. If the blood has no bactericidal action, the pneumococci which have remained on the wall of the tube find themselves in a favorable medium and multiply rapidly; if it is bactericidal they are killed and no growth results. Readings are made by blowing out the contents of the tube on a glass slide, staining, and examining them under a microscope. By combining several capillary tubes into one many-stemmed pipet, modeled after the one Wright uses for estimating the coagulation time of the blood, and by using a series of ascending dilutions of broth culture, an approximate quantitative value may be given to the test.

Using this method has shown that the blood of pigeons, a species immune to pneumococcal infection, destroys virulent pneumococci *in vitro*, whereas the normal blood of rabbits, a species highly susceptible to the organism, has no such action. If, however, rabbits, whose blood was previously tested, and proved a favorable culture medium for the germs, were suitably immunized with dead bacteria, their blood would show an acquired bactericidal power. No bactericidal action on pneumococci was, however, found in this defibrinated blood, or in the serum of pigeon, normal rabbit, or inoculated rabbit. The most general conclusion, and the most important one, to be drawn from the work upon bactericidal activity of whole blood *in vitro*, is that whole blood, before it coagulates, possesses bactericidal properties which can be investigated and measured with considerable accuracy—properties which do not become apparent when blood serum alone is examined. Increasing the virulence of pneumococci for rabbits increases their ability to grow in rabbit blood *in vitro*. The mathematical expression of the ability of a strain of pneumococci to grow in the blood of normal rabbits *in vitro* is an expression of the virulence of the strain for rabbits.

The production, by suitable inoculations of specific bactericidal activity into the blood of rabbits, for pneumococci of one type, is accompanied by the production of slight bactericidal activity for other types.

A bacterin prepared from pneumococci washed from the peritoneal cavity of a rabbit which has died of pneumococcal infection is

more powerful as an immunizing agent for rabbits than one prepared from pneumococci grown upon artificial culture media.

W. LINTZ.

MURPHY, J. B., AND NAKAHARA, W.: The Lymphocyte in Natural and Induced Resistance to Transplanted Cancer. A Histological Study of the Lymphoid Tissues of Mice with Induced Immunity to Transplanted Cancer. *The Journal of Experimental Medicine*, Jan. 1, 1920, xxxi, No. 1, p. 1.

Of the theories brought forward to explain the natural and induced resistance of mice to transplanted cancers, the theory of Da Fano was the first to call attention to the lymphocyte as a possible active agent in cancer immunity. He noted the fact that not only was there an increase in the number of lymphocytes about the graft in resistant animals, but also an increase in the number of these cells in the subcutaneous tissues.

In the work presented in this paper a study has been made of the lymphoid organs in animals with induced immunity to cancer, in order to establish a further link in the evidence associating the lymphocyte with cancer immunity, and to ascertain if possible the source and nature of the blood lymphocytosis. In the course of the experiments a histological examination was made of the changes in the subcutaneous tissue in order to check and possibly extend the earlier observations of Da Fano.

The experiments were conducted upon 100 mice. Adenocarcinoma bits No. 63 (Bashford) were used for inoculation. All the mice used in the experiments were of the same stock and of about the same weight. The virulence of the tumors used in each experiment was tested by inoculation into a number of normal mice.

Defibrinated mouse blood was used to induce immunity, being administered subcutaneously and, in some cases, intraperitoneally. Observations were made of the effect upon the spleen, lymph-glands, the circulating lymphocytes, the subcutaneous connective tissue, the thymus, the thyroid, the liver, kidneys, and bone-marrow.

The mice immunized against cancer as described show in the germinal centers of the lymphoid organs a marked increase in the number of mitotic figures. The increase becomes evident forty-

eight hours after injection, in the majority of instances, and reaches its climax on about the fifth day. After this time it subsides, returning to the normal rate on about the tenth day.

These immunized animals, when inoculated with a cancer graft ten days after the injection, show a second stimulation of the lymphoid centers similar to the first but more intense in character. The increase in the number of mitotic figures becomes evident as early as twenty-four hours after the cancer inoculation, and persists to a marked degree for a week, after which there is a gradual return to the normal rate.

The lymphocytes of the circulating blood during the establishment of the immunity show frequent examples of amitotic division, and many examples of irregular and lobulated nuclei. These changes suggest intensified functional activity.

Contrary to the statements of Da Fano, cellular reaction in the subcutaneous tissues of immunized animals is present only in the region infiltrated by the injected cells. This fact becomes conspicuous when the immunizing injection is given intraperitoneally, in which case no cellular accumulations are noted in the loose connective tissues.

No constant cellular changes are noted in the bone-marrow, thymus, or thyroid gland, liver, or kidney of the treated animals.

H. M. FEINBLATT.

LOSEE, J. R.: Blood Transfusion. *American Journal of Medical Sciences*, Nov., 1919, clviii, No. 5, 711.

The indirect method of transfusion, on account of its universal adoption, has saved many patients from acute hemorrhage. Primary and secondary anemia cases should be transferred early in the disease, in order to obtain the best results. Certain laboratory examinations are absolutely essential to the success of the transfusion. The syringe canula method transfers blood from the donor to the recipient with the least possible physical or chemical change, and is therefore associated with fewer reactions. No definite relation can be established between the amount of blood transfused and the blood-count afterward.

A. T. MAYS.



BUELL, M. V.: Studies on Blood Regeneration. I. The Effect of Hemorrhage on the Alkaline Reserve. *Journal of Biological Chemistry*, 1919, xl, 29.

The article reviews previous work on the subject, and results observed with hemorrhage, when complicated by shock, etc., and under normal conditions. The experiments describe the application of the Van Slyke method to the determination of the alkaline reserve in hogs, the hemorrhage being produced by tail bleeding. The author's conclusions follow:

(a) If the blood is allowed to flow directly from an artery into a paraffined vessel containing potassium oxalate, and if the blood so obtained is allowed to stand for a definite time (from one-half to two hours) before centrifugation, the alkaline reserve values obtained by the analysis of the plasma by the Van Slyke method bear a fairly definite relation to the alkaline reserve as it exists in the body. These results can be duplicated with satisfactory accuracy. Alkaline reserve values obtained by this method are lower than values obtained by bringing the blood to a definite  $\text{CO}_2$  tension immediately after centrifugation, but are consistent with them under definite conditions.

(b) In the case of pigs subjected to hemorrhages amounting approximately to 1.3 per cent of the body weight, a study of the alkaline reserves immediately after the hemorrhages resulted in the following observations: Hemorrhages of this magnitude were usually accompanied by a somewhat lowered alkaline reserve during the first few hours after bleeding. The drop was small if the animal was quiet during the experiment, but much greater if the animal struggled, being noticeable soon after struggling took place. When the animal remained quiet the maximum drop was reached within half an hour after the bleeding was complete. At the end of five hours, and often sooner, the alkaline reserve was near its original value. There was considerable variation in the reactions of the different animals. Animals restricted to corn and water and bled seven times at intervals of five days gave an alkaline reserve value, with the first blood shed on any day, that bore no relation to such factors as the number of times the animals had been bled previously, or the amount of blood (within the limits of these experiments) taken at previous bleedings.

(c) The total N of the blood always fell immediately after hemorrhage. There was a distinct tendency for the urea nitrogen and the nonprotein nitrogen to rise. Although one animal was bled seven times while restricted to a diet of corn and water, the percentage of chlorids in the blood remained constant. On this inadequate diet (corn and water), under conditions of repeated hemorrhage, there was a distinct tendency toward regeneration of blood proteins.

W. H. EDDY.

BUELL, M. V.: Studies on Blood Regeneration. II. Effect of Hemorrhage on Nitrogen Metabolism. *Journal of Biological Chemistry*, 1919, xl, 63.

This combines the work of a previous paper and gives the results of studies of nitrogen excretion. The conclusions follow:

(a) On a diet of corn and water, under conditions of repeated hemorrhage, the creatin excretion of two pigs was definitely increased. This effect was cumulative. When the diet was restricted to starch and water, the second hemorrhage caused an increased excretion of total nitrogen, phosphates and creatin.

(b) The theory that hemorrhages amounting to 6 c.c. per pound of body weight are not necessarily accompanied by a severe grade of acidosis, is supported by the following observations: The drops in the alkaline reserves were slight and of short duration; there was no great increase in the ammonia nitrogen excretion after hemorrhage, and the hydrogen-ion concentration of the urine was not definitely affected by hemorrhage.

W. H. EDDY.

BURGE, W. E.: The Effect of Adrenalin on the Blood Catalase. *The Journal of Laboratory and Clinical Medicine*, Oct., 1919, v, No. 1, p. 59.

The introduction of adrenalin into the portal vein of dogs stimulates the liver to a greatly increased output of catalase, an enzyme which increases the oxidation in the tissues characteristic of great

muscular exertion. It is now considered that during combat the adrenals are stimulated to an increased output of adrenalin and that this, besides producing constriction of the small vessels of the abdominal viscera, thus increasing the blood supply to the heart, skeletal muscles, and nervous system, hastening the coagulation of the blood, and increasing the output of sugar from the liver, also causes the above described output of catalase, with the accompanying increased oxidation and greater muscular exertion.

C. M. ANDERSON.

COHEN, B., AND SMITH, A. II.: The Colorimetric Determination of Hemoglobin. *Journal of Biological Chemistry*, 1919, xxxix, 489.

The object of the investigation was a method suitable for field conditions, away from the conveniences of a fully equipped laboratory. The method devised combines that of Sahli and Palmer. The hemoglobin of whole blood is changed to acid hematin with HCl and compared with a standard in a colorimeter. When the Autenrieth-Hellige colorimeter is used, the method is admirably adapted to field use and yields accurate results. The authors also show that the acid hematin standard from the blood of one species may be used in the colorimetric determination of hemoglobin in the blood of a variety of other species of animals.

W. H. EDDY.

ROTHSCHILD, M. A., AND FELSEN, J.: The Cholesterol Content of the Blood in Various Hepatic Conditions. *Archives of Internal Medicine*, Nov. 15, 1919, xxiv, No. 5, p. 520.

These authors, who have previously reported hypercholesterinemia as a common finding in obstructive cholelithiasis with jaundice, now report on a study of 15 cases of other hepatic conditions associated with jaundice. In this series no hypercholesterinemia was evident; in fact the figures encountered were frequently below normal. In hemolytic icterus, also, they found no increase in blood cholesterol.

T HOWARD.



REIMANN, S. P., AND BECKER, C. E.: The Catalases of the Blood During Anesthesia. *American Journal of Physiology*, 1919, 1, 54.

Two theories are extant in explanation of the production of anesthesia by anesthetics. One states that effects are produced by diminishing the permeability of cell membranes. The other, that of Verworn and his followers, holds that anesthesia is produced by the inability of the cell to use oxygen, the anesthetics depressing the oxygen activators or oxygen enzymes. The work of this paper was carried out as a result of the publication by Burge, which stated that the catalases in the blood were diminished by anesthesia. By methods which they claim were at least as accurate as those of Burge they find in the cases studied that the catalase was decreased in 65 per cent of the cases and increased in 35 per cent. They therefore hold that there is little basis for the view that the catalases play an important rôle in anesthesia.

W. H. EDDY.

LANGSTROTH, L.: Blood Viscosity. I. Conditions Affecting the Viscosity of Blood After Withdrawal from the Body. II. Effect of Increased Venous Pressure. *The Journal of Experimental Medicine*, Dec. 1, 1919, xxx, No. 6, pp. 597, 607.

I. The viscosity was measured by the viscosimeter of Determann, which required only 0.2 c.c. of blood for a determination. Readings were made at 20° C. (68° F.), with a stop-watch recording 0.001 minute. Coagulation was prevented by wetting the inside of the syringe with a saturated solution of oxalate.

Small amounts of potassium oxalate have practically no effect upon the viscosity, and the changes ascribed to it may be attributed to variation in the carbon dioxid content, or to sedimentation of the red blood-cells. Exposure to air rapidly increases the viscosity due to the loss of carbon dioxid. It is important, in determining viscosity, that the red-cells should be uniformly suspended by rotating 5 or 10 c.c. of blood in a separating funnel for one minute.

II. A rise in venous pressure caused by the application of a

loose binder to the arm results in a marked increase in the viscosity of the whole blood. This is primarily due to a concentration of the blood in the capillaries. This concentration is shown by an increase in the viscosity and total nitrogen of the plasma, an increase in the relative volume of the red blood-cells, and an increase in the relative percentage of hemoglobin. Changes in viscosity of the whole blood following venous stasis apparently bear no demonstrable relation to the carbon dioxide or oxygen content.

F. M. FEINBLATT.

MCCLENDON, J. F., COLE, W. C. C., ENGSTRAND, O., AND MIDDLEKAUFF, J. E.: The Effects of Malt and Malt Extracts on Scurvy and the Alkaline Reserve of the Blood. *The Journal of Biological Chemistry*, 1919, xl, 243.

The object of the authors of this paper was to determine whether in the entire absence of fresh foods, scurvy may be prevented or cured by malt products suitable for food for infants and adults. The work of various authors calling attention to the presence of the antiscorbutic principle in sprouting cereals and beans is reviewed. The experiments were conducted with guinea pigs and rabbits. Their experiments demonstrated that sprouted cereal grains (specifically barley, wheat and rye) are rich in antiscorbutic substance, especially after the arospire projects one-half inch beyond the grain. Special studies were also devised to determine whether acidosis was associated with the scurvy symptoms. From measurements taken of the alkaline reserve no essential difference between guinea pigs with and without scurvy was observed and the authors conclude that "acidosis has nothing to do with scurvy." The antiscorbutic substance in the sprouted grain was not destroyed by heating to 70° C. to gelatinize the starch.

Aside from these general conclusions certain experiments were devised to extract the antiscorbutic substance from the sprouted grain by crushing it between steel rolls of a special mill. Under the methods used the crushed barley yielded an extract that cured scurvy. This method is suggested as a means of supplying infants with the principle when they are too small to eat the cereal and in the absence of other antiscorbutic substances, as noted in the object of the experiments. Ordinary commercial malt extract does not contain the anti-

scorbutic substance, according to Fürst, and the method employed by the authors is apparently necessary to break up the cells of the aërospire and release the principle. It is also desirable to sprout the grain to a more advanced stage than is done merely for the development of diastase.

W. H. EDDY.

LUDEN, G.: Studies on Cholesterol. VI. The Value of Blood Cholesterol Determinations and Their Place in Cancer Research. *The Journal of Laboratory and Clinical Medicine*, Sept., 1919, iv, No. 12, p. 719.

With the exception of Joslin, Rothschild and perhaps a few others, clinicians seem to be under the impression that cholesterol determinations have little or no practical value. The author asserts that her observations over three years of study strongly suggest that tests for cholesterol are of clinical value, although they should not be looked upon as specific diagnostic tests but rather as an aid in diagnosis, like the presence of albumin in the urine, which is of clinical value, even though it does not differentiate cystitis and nephritis, in the absence of other data.

Apart from the problems connected with cholelithiasis, the cholesterol content of the blood appears to play an important part in growth, both normal and neoplastic. Robertson and Burnett thought that the rate of tumor growth in rabbits could be accelerated by intravenous injection of cholesterol, but that if the cholesterol molecule were changed (by transfusion of "pure" cholesterol into acetyl cholesterol or cholesterol chlorid), the tumors would no longer be affected. In this connection it is important to know that radium treatment increases the amount of "changed" cholesterol in the blood, while reducing the pure cholesterol.

To understand the mechanism involved in the relation between cholesterol, metabolism and malignant growths further observations are needed, but the author emphasizes five points in this connection:

- (1) The nature of the test for cholesterol.
- (2) The importance of a uniform method for cholesterol determinations.



- (3) The source of cholesterol intake.
- (4) The factors that influence blood cholesterol.
- (5) Practical results to be expected in cancer research from the study of cholesterol metabolism.

Luden attributes much importance to a uniform laboratory technique for the chemical reaction. Some investigators use whole blood; others, blood serum; different color standards are in use, different methods of using the colorimeter, and different temperatures at each determination; there is a difference in the time used to ripen the test, etc.

A detailed account is given of the author's method (quite similar to Bloor's) used in 1,500 determinations, and also of the preparation of a permanent standard, which is suitable, uniform, convenient, and economical.

Cholesterol ( $C_{27}H_{45}OH$ ) forms a constituent of every mixed diet, being very high in eggs (888 mg. per 100 grams), and moderately high in butter and chicken. Beef contains 63 mg. per 100 grams, milk 28 mg. per 100 c.c. Oatmeal is one of the few foods which contain no cholesterol.

Since cancer patients are shown to have much blood cholesterol, the value of eliminating foods rich in cholesterol can be seen. For if so much can be done for diabetics by safe-guarding the weak spot in their metabolism it is rational at least to try and lighten the task of cholesterol metabolism by dietetic supervision.

The amount of changed cholesterol in the blood is influenced by a number of factors, namely, by radium treatment, by the processes of digestion, by acute bacterial infection, by ulceration and hemorrhage, or by any process which causes body reaction, thus increasing the metabolic rate. It will be remembered that the process of spontaneous regression in malignant tumors is usually accompanied by ulceration, sloughing, or hemorrhage, that radium treatment produces these symptoms, that acute bacterial infection often exerts a curative influence on tumor growth, and that the rate of basal metabolism is manifestly increased in all of these factors.

The author cites several cases to illustrate that the stimulation of the metabolic rate plays an important part in recovery or spontaneous recession of tumors in man, and that the cholesterol metabolism is influenced directly by increased metabolic rate. The higher

the metabolic activity, the lower the pure cholesterol content of the blood. In carcinoma we have not yet been able to recognize the organ which may be chiefly responsible for the type of faulty metabolism that can incite the cells to lawless proliferation. Had the same amount of energy that has been devoted to the study of chemical and metabolic details in diabetes been similarly employed in cancer research, the verdict that "90 per cent of those in whom cancer develops succumb to the disease," might never have been pronounced.

Blood cholesterol determinations, made systematically in conjunction with observations on the rate of basal metabolism, and on other chemical constituents of the blood and urine, as well as the cytology of the blood, might reasonably be expected to advance our knowledge in this direction. It is for the purpose of further study on lipid metabolism that the determination of blood cholesterol, one of the chief blood lipids, should have a place in cancer research.

C. M. ANDERSON.

KAHN, M. H.: The Position of the Arm in Blood-pressure Measurements. *American Journal of Medical Sciences*, Dec., 1919, clviii, No. 6, p. 823.

In men between twenty and thirty there is a change in blood-pressure, both in normal and abnormal conditions, when the arm is raised from the side of the body, whether the subject is sitting, standing, or recumbent. Graphic curves are given to show the diagnostic importance. In normal cases the curve shows a progressive fall of the systolic and diastolic pressures as the arm is raised. At 45 degrees elevation the pressure falls 8 mm. of mercury; it falls 6 mm. more with elevation of 90 degrees, 14 mm. more at 135 degrees, and 25 mm. more with the arm vertical. The diastolic pressure corresponds, but is slightly less. In effort syndrome cases the fall is more marked: 15 mm. with elevation of 90 degrees, and 52 mm. with the arm at 180 degrees elevation. The diastolic pressure is slightly less. In thyrotoxic cases and exophthalmic goiter the total systolic loss with the arm at 180 degrees averaged 84 mm., the diastolic 52 mm. In cases of nephritic hypertension the pressure yields little. It falls 9 mm. at 45 degrees of elevation, 6 mm. more with the arm at 90 degrees, 6 more with elevation of 135, and only

2 mm. more with the arm at 180 degrees. In aortic regurgitation the diastolic pressure falls more steeply and more promptly than the systolic. Its maximum fall occurs at 90 degrees elevation and remains there to an elevation of 180 degrees.

A. T. MAYS.

BARACH, J. H.: The Energy Index (S. D. R. Index) of the Circulatory System. *Archives of Internal Medicine*, Nov. 15, 1919, xxiv, No. 5, p. 509.

Barach computes the energy index by adding the systolic and diastolic pressures and multiplying the sum by the heart-rate per minute. He finds from a study of 250 normal young men that the normal index should not exceed 20,000 mm. Hg. pressure per minute. In an examination of 1,171 soldiers referred to the special cardiac board for supposed cardiac abnormalities—out of 26,396 who passed through the mustering office—175 were rejected as having actual circulatory defects. Seventy-eight per cent of the men rejected showed abnormalities in the S. D. R. index.

T. HOWARD.

WILSON, D. W. AND GOLDSCHMIDT, S.: The Influence of Oxygen Administration on the Concentration of the Blood That Accompanies the Development of Lung Edema. *American Journal of Physiology*, 1919, 1, 157.

The rapid development of edema of the lungs which accompanies severe gassing of animals in warfare was the basis of the above investigation. The authors find that the loss of water from the blood in such cases is due to the development of the edema of the lungs. The continuous administration of oxygen to goats gassed with chlorpierin did not inhibit the concentration of the blood. The percentage of saturation of the hemoglobin with oxygen was normal even after a considerable concentration of the blood had occurred. This concentration of the blood is not caused by the imbibition of water by the tissues as the result of oxygen want.

W. H. EDDY.



McMABON, T.: Studies of Cases of "Effort Syndrome" with Measured Work. *American Journal of Medical Sciences*, Dec., 1919, clviii, No. 6, p. 818.

At General Hospital No. 9, a study was made of the changes in pulse-rate and blood-pressure in 50 cases of effort syndrome and in 11 normal cases after fatiguing the subjects with hand exercise. The former patients did less work, the pulse-rate was higher at rest, and there was no delayed rise of blood-pressure suggesting myocardial insufficiency. Under-nourished and poorly developed skeletal muscles, determined by tests, must be considered in the study of the causes of fatigue following slight exertion.

A. T. MAYS.

WIGGERS, C. J.: Factors Determining the Relative Intensity of the Heart-Sounds in Different Auscultation Areas. *Archives of Internal Medicine*, November 15, 1919, xxiv, No. 5, p. 471.

From an experimental study on dogs, using recording capsules devised by Dean and the author, Wiggers was able to demonstrate the relation of certain factors to the intensity of the heart-sounds. Changes in the intensity of any heart-sound over a particular area were determined by comparing the amplitude and number of vibrations entering into that sound complex before and after modified conditions of the circulation were experimentally produced. It was found that the intensity of the first sound is not related to the volume of blood discharged by the ventricles, *e. g.*, during the slowing of the heart; when the systolic discharge is increased, the first sound is reduced in intensity. The intensity of the first sound over all regions varies directly as the systolic tension develops within the ventricles. The intensity of the second sound increases or decreases with the pressure (aortic or pulmonary) at the beginning of diastole. In the case of the injection of pituitary extract, which increases the pressure in the systemic circuit, and decreases the pressure in the pulmonary circuit, there was an increase in the intensity of the first sound at the apex and of the second sound in the aortic area, and a diminution of the second sound in the pulmonic area. The author

concludes that with the exercise of reserve and caution, a change in the intensity of the first sound over any area may be taken as strong evidence of a change in tension developed during systole of the ventricles, while a change in intensity of the second sound over the aortic and pulmonary areas may be safely used as an index of a change of pressure at the beginning of diastole in the greater and lesser circuits, respectively.

T. HOWARD.

HOGUE, M. J.: The Effect of Hypotonic and Hypertonic Solutions on Fibroblasts of the Embryonic Chick Heart *in vitro*. *The Journal of Experimental Medicine* Dec. 1, 1919, xxx, No. 6, p. 617.

The experiments were made upon the hearts of chick embryos from six to nine days old, work being conducted under aseptic conditions.

*The Effect of Hypotonic Solutions.*—Locke-Lewis solutions were made hypotonic by the addition of distilled water. These were made with a sodium chlorid content of 0.54, 0.45, 0.3 and 0.225 per cent respectively. The tissues grew in the first two solutions, which acted as a stimulus, but did not live as long as when grown in Locke-Lewis solution, although the growth was more rapid. The cells of normal growth were killed by a hypotonic solution of 0.3 and of 0.225 per cent respectively. The cell-nuclei absorbed much water and frequently formed nuclear vacuoles as outlets for the extra liquid absorbed. Mitochondria were not affected by the hypotonic solutions, but as the cells died vesicles formed at the extremities and persisted after the mitochondrion had disappeared.

*The Effect of Hypertonic Solutions.*—In hypertonic solutions the optimum growth was reached on the third day or later, and the growth lived longer but was smaller than that grown in the hypotonic solutions. Hypertonic solutions were made by boiling down Locke-Lewis solutions until the sodium chlorid content was 1.2, 1.5, and 1.8 per cent respectively. Tissue grew in the first two of these solutions, but not as long as in normal Locke-Lewis solution. The cells of normal growth were killed by solutions containing 1.8 and 1.5 per cent sodium chlorid. The effect of the hypertonic solutions

was to contract the cells and to cause their thin threadlike processes to be drawn into the cell. The neutral red channels formed in many cells, and the cytoplasm frequently became alveolar when death set in.

H. M. FEINBLATT.

KAKINUMA, K.: Studies on the Extract of Lung. *American Journal of Physiology*, 1919, 1, 9.

The toxic effect of injected lung tissue extract has been investigated by Mills in this country and ascribed by him to its clotting power. The author of the present paper has investigated the same substance and reaches the following conclusions: Intravenous injection of beef lung extract in guinea pigs invariably causes dyspnea, and in a majority of cases convulsions as well. The minimal lethal dose varies from 0.02 to 0.15 c.c. per 100 grams of body weight. Glucose destroys the toxicity of lung extracts, 1 c.c. of 10 per cent glucose mixed with the minimum lethal dose of lung extract renders the latter inert. Hypodermic injection of adrenalin immediately before an intravenous lethal dose of lung extract is protective in effect. Intravenous injection of lung extract causes a slight increase in the blood-sugar of rabbits.

W. H. EDDY.

ADAMS, F. D., AND STURGIS, C. C.: Note on the Vital Capacity of the Lungs and the Carbon-dioxid-combining Capacity of the Blood in Cases of "Effort Syndrome." *American Journal of Medical Sciences*, December, 1919, clviii, No. 6. p. 816.

A study is given of 100 cases of effort syndrome at Base Hospital 9, Lakewood. The constant complaint was shortness of breath on slight exertion. The conclusion was that the dyspnea was not dependent upon diminished vital capacity of the lungs. The chemical content of the blood fell within normal limits in all instances.

A. T. MAYS.



ALVAREZ, W. C.: Recent Advances in Gastric Physiology. *American Journal of Medical Sciences*, Nov., 1919, clviii, No. 5, p. 609.

Experiments with sections of stomach taken from animals and executed criminals show a graded rhythmic character of the gastric wall downward, likened to a pacemaker of the heart with much slower waves. The most rhythmic muscle is along the lesser curvature. Small strips of muscle from different parts of the stomach, immersed in warm, aerated Locke's solution, were used. The most sensitive parts, with the most pronounced tendency to rhythmic contraction, were from the lesser curvature near the cardia. The slowest to respond came from the greater curvature, from the pyloric antrum. The amplitude of contraction was found to be smallest near the cardia, and largest in the antrum. There is a gradient of irritability from the cardia to the pylorus. The latent period is shortest near the cardia and longest in the pyloric antrum. The muscle in the cardia is more delicate and will not react so well after trauma. The antral muscle is much tougher and will react after trauma. After stimulation the fundus muscle remains tonically contracted, while the antral muscle promptly relaxes. The duodenum was found to be more irritable than the antrum, and its rhythmic rate higher. In accordance with this there was a regional difference in chemical structure, and in rate of metabolism. Attention is drawn to the fact that only a few bundles of longitudinal connective tissue pass over between the antrum and the duodenum; thus the visible gastric waves are not carried over. There is a gradient of metabolism underlying and perhaps giving rise to the gradients of irritability, latent period, and rhythmicity which it is believed determine the direction of peristalsis. The metabolic gradient is often found to be reversed in sick animals which refuse food. The lowest values in the entire digestive tract are in the antrum, and this may explain the many instances of cancer which occur in that region, and the inability of tumors to cross into the duodenum, where the metabolic rate is very high. In ulcer of the lesser curvature a sleeve resection is found to give better functional results than a V-shaped excision.

A. T. MAYS.

## SECTION ON PEDIATRICS

SHAW, H. L. K.: The Child and the State. *Archives of Pediatrics*, Aug., 1919, xxxvi, 456.

A world-wide wave of realization of the potential loss brought about by high infant mortality has come as one of the great lessons taught by the war. Conservation of its children is one of the problems foremost in the minds of all nations. It is an economic necessity to most of them, as their political positions are threatened.

Sir George Newman was one of the first, a few years ago, to lay down the principles of child welfare, which are, in brief, that all poorly nourished, diseased or defective children should receive the proper attention from the state.

The author points out the progressive reduction in infant mortality in New York City during the past few years, due to the fact that ignorance has been supplanted by proper educational propaganda, as for instance: prenatal work, child welfare stations and nurseries, preschool and school medical inspections, classes for the poorly nourished, preventoriums for the pretuberculous, dental clinics, the care and education, both mental and physical, of the crippled child, child labor laws, etc.

New York State has accomplished the following reforms through the division of child hygiene: the establishment of child welfare stations; stations for public health nurses; local agencies established to promote the work; instruction in prenatal and postnatal care; provision for the sick babies in hospitals; supervision of day nurseries; improvement of birth registration; newspaper publicity on child welfare, and the creation of a demand for better milk.

The author emphasizes what the state owes its potential citizens by suggesting, as a solution, the outline on reconstruction and the

child, proposed by Dr. S. Josephine Baker. It would consist of a commissioner who would supervise several bureaus, among them one of child welfare institutions, one of mental hygiene, a bureau of recreation, a bureau of delinquency, a bureau of child labor, a bureau of child hygiene, and one of child legislation.

T. B. GIVAN.

LESNÉ, E., AND BINET, L.: Observations and Experiments on the Arterial Circulation of Nursing Infants. *Archives de médecine des enfants*, Paris, Feb., 1920, xxiii, No. 2, p. 69.

Lesné and Binet, using a small pneumatic arm-band attached to a sphygmometer (oscillometer of V. Pachon) determined the maximum arterial tension (corresponding to the pressure when the oscillations of the needle commence to increase), the minimum arterial tension (the pressure when the oscillations decrease) and the oscillometric index (the maximum range of the oscillating needle). They obtained the following results in normal nursing infants when the latter were quiet and supine:

Age	Maximum Tension		Minimum Tension		Oscillometric Index
At birth . . . . .	55	mm. of Hg.	35	mm. of Hg.	
1 month . . . . .	60	" " "	50	" " "	10 divisions
2 and 3 months . . . . .	80	" " "	30	" " "	25 "
4, 5, 6 " . . . . .	90	" " "	30-40	" " "	50 "
7 " . . . . .	100	" " "	40	" " "	50 "
14 " . . . . .	110	" " "	40	" " "	75 "
19-20 " . . . . .	130-140	" " "	50	" " "	

Nursing raises the maximum tension, but not the minimum or the index. Crying raises the maximum and index. Sleep lowers the maximum and minimum. Sex makes no difference.

In premature infants, in gastro-intestinal disturbances, in athrepsia and pulmonary tuberculosis, there is marked hypotension and a fall in index.



There are no tension changes in mild acute lung lesions, in pleurisy, slight infections and glandular tuberculosis.

In healthy nurslings there is considerable variation in cardiac rhythm. Rates over 100 per minute were noted in infants under four months, and less than 100 in those over four months. Crying raises pulse, nursing slows it.

The oculomotor reflex is more marked in infants of two weeks than in adults.

Inhalation of amyl nitrite causes marked vasodilatation in nurslings of three months, but none in those of from three to four weeks.

W. C. DAVISON.

KERLEY, J. H.: Acetonuria and Cyclic Vomiting in Children.  
*Archives of Pediatrics*, Aug., 1919, xxxvi, 472.

Certain children, between two and ten years of age, neurotically inclined, whose parents have led sedentary lives, are affected periodically with a syndrome of symptoms which is peculiar, in that no specific etiology has been determined.

Evidently a disturbed fat and carbohydrate metabolism plays a great part, in that the acetone bodies, which are found almost constantly in the urine in these patients, in relatively large quantities, are such that the reduction of these elements in the diet during the acute stage shortens its duration, and their reduction during the intervals between the attacks renders the patient less liable to the recurrence.

Alkalis are advised during the attack and in the interim, to combat the acid intoxication.

The diet should consist, mainly, of cereals, fat-free milk, or buttermilk, bacon, minced chicken, fish, green vegetables, potato, stewed fruit, rice, bread or tapioca puddings, cornstarch or junket. Egg or raw fruit should not be given. When sugar is begun, the malts should be given first.

The child's hygiene should receive due attention.

T. B. GIVAN.

LINDSAY, L. M.: Recent Additions to Our Knowledge of Infantile Scurvy. *The Canadian Medical Association Journal*, Feb., 1920, x, 202.

The author calls attention to the fact that Funk and Hopkins were the first to demonstrate the necessity of certain accessory food elements in order to prevent scurvy and to promote health and growth. Funk called these accessory elements: vitamins. Since then it has been proven that deficiency, or absence, of these vitamins in food may give rise to the so-called "deficiency diseases," such as scurvy, beriberi and pellagra.

These vitamins are found to be most abundant in fresh fruits, green vegetables, and some tubers; they are present in smaller quantities in fresh meats and milk; they are apparently absent in yeast, vegetable fats, and cereals.

Exposure to prolonged high temperatures destroys the anti-scorbutic vitamin, while drying and other methods of preservation injure it. Boiled milk and, to a lesser degree, pasteurized milk, is deficient in this important element, and even raw milk may contain comparatively little of it.

The following table, compiled by the author from the investigations of the American Pediatric Society, shows the various forms of milk foods, during the use of which scurvy developed:

Breast milk	3 per cent
Cow's milk (uncooked)	1.5 per cent
Pasteurized milk	5 per cent
Condensed milk	15 per cent
Sterilized milk	25 per cent
Proprietary infant foods	50 per cent

It has been shown by McCollum and Simmonds that the quantity of vitamin in milk depends upon the kind of food consumed by the cow; therefore raw milk contains less vitamin in the winter than in the summer. Breast-fed babies occasionally become scorbutic, possibly because the mother's diet contains no fresh fruit or fresh vegetables. This would seem to show that the mammary gland selects the essential vitamins from the blood and passes them into the milk, but that the gland itself cannot produce them.

The necessity of vitamins for nutrition has been well demonstrated in experiments with guinea pigs, which developed scurvy in from ten to twenty days when fed on rolled oats and hay, with the addition of some stimulant to peristalsis such as agar-agar, mineral oil, or phenolphthalein. It has been suggested that the newly-born of healthy mothers come into the world with a reserve supply of vitamins to protect them until they are ready to take other nourishment than milk, and that only those who have not a sufficient quantity of this reserve will develop scurvy.

In many cases scurvy may be latent and clinically unrecognizable. According to Hess, it takes about six months to develop sufficiently to be recognized clinically. An infant who, after thriving for some time, begins to lose weight, or does not gain, becomes irritable and refuses nourishment, should be suspected of having scurvy. There is little difficulty in the diagnosis of an outspoken case when there is tenderness and pseudoparalysis of the extremities with hemorrhages from the gums and kidneys. It is well to bear in mind, however, that hemorrhages in the gums do not occur unless teeth are present, and, inasmuch as scurvy is often associated with rickets and delayed teething, this symptom may not be found. Professor Morse of Harvard (cited by the author) has recently seen an infant with scurvy whose chief symptom was double proptosis (protrusion of both eyeballs) due to hemorrhage into the sockets.

As soon as antiscorbutic measures are employed the acute symptoms rapidly disappear (within a week). Orange juice, or tomato juice, are ideal antiscorbutics. These juices may be given in doses of from  $\frac{1}{2}$  to 1 ounce daily; they are best given in one or two doses during the day, one hour before feeding. If necessary the dose may be doubled. In addition to this it is also necessary to correct the diet, and to substitute for any patent or desiccated food one containing some fresh milk, but this is often not essential to the cure. Breast-feeding, as long as the mother's diet contains a certain amount of fruit and vegetables, practically insures the nursing infant against scurvy.

It has been found that fresh orange juice has approximately four times as many vitamins as fresh lime juice. Carrots are much poorer in this substance than beets. A tablespoonful of baked mashed potato, added to a pint of water, is an excellent diluent of milk, and a powerful antiscorbutic agent. Raw meat and meat



juices are not rich in water-soluble and antiscorbutic vitamins, but pancreas, liver and kidney contain considerable quantities. Heart-muscle stands between these two groups in this respect. Cow's milk, even when fresh, is comparatively poor in antiscorbutic properties, while dried milk is of still less value. Scalded milk holds an intermediate position. Winter milk seems to be inferior to summer milk; this difference is apparently due to the differences in the cow's diet during these seasons.

According to Lindsay, these facts are of great importance these days when condensed milk and patent foods are so largely used in infant feeding.

M. KESCHNER.

VARIOT, G., AND CAILLIAU: Congenital Scdle Skin in an Infant of Two Years, Agensis of the Elastic Reticulum of the Dermis. *Archives de médecine des enfants, Paris*, Feb., 1920, xxiii, No. 2, p. 106.

Variot and Cailliau report the case of a girl of two years whose skin, at birth, hung in folds as if it were too large for her. The only other abnormalities were an inguinal hernia and a systolic murmur. A roentgenogram of the heart showed that it was not enlarged. The condition was first diagnosed as myxedema and the patient was given thyroid extract, which caused her to lose weight; the skin folds became more pronounced. The diagnosis of cutis laxa was then made. Good diet increased the patient's weight and reduced but did not obliterate the loose folds of skin. The skin was supple, loose, slightly elastic, and retracted slowly like the skin of an old woman. Sections of the skin (removed during herniotomy), when stained with orcein, showed marked reduction and shortening of the elastic fibers. Sections stained with hematin-eosin showed no changes. A somewhat similar picture was seen in sections of skin from old persons of sixty-eight years, and from a six months old fetus. Sections of the skin of an eight months old fetus and of children of from two to five years showed no reduction of the elastic tissue. The only other conditions approaching this are megalodermia (Concetti), which causes a proliferation of elastic tissue, and geromorphism (Charcot and Souques) which is acquired and not congenital.

W. C. DAVISON.

MINSELL, H. R.: Thick Cereal Feedings in Twelve Cases of Malnutrition in Infancy, with Report of Two Typical Cases. *Archives of Pediatrics*, August, 1919, xxxvi, No. 7, p. 449.

Recognizing the beneficial effects of the use of thick cereal feedings in pyloric stenosis and pylorospasm, as practiced by Dr. L. W. Sauer of Chicago, the author undertook to apply the method to a series of marasmics and other exceptionally difficult feeding cases. Great care was exercised in selecting the class of patients who had been taken to doctor after doctor and had been on this formula and that one, and yet, although assimilation was apparently good, simply failed to gain in weight.

The formula was prepared in this way: Add to 7 fluidounces of 1 per cent milk one tablespoon of farina or rice flour plus 3 per cent cane sugar; cook at least thirty minutes or until tenacious. The percentage of fat and the amount of cereal can be increased gradually as indicated. In some cases it is necessary to give water to make up fluid deficiency. Antiscorbutics are to be given. Two cases are fully reported which clearly show the efficacy of this method in selected cases, especially those showing a lack of tolerance for the usual modifications of milk formulas.

T. B. GIVAN.

GORDON, M. B.: The Rôle of the Pineal in Pediatrics. *Endocrinology*, Oct.-Dec., 1919, iii, No. 4, p. 437.

The greatest post-natal development of the pineal gland occurs during the first few years of life, and at puberty involution of the gland takes place. Experimental extirpation of the gland is difficult, and Dandy, who was able to remove the pineal body *in toto*, believed that his experiments yielded nothing to sustain the evidence that it has any endocrine function of importance in either old or young dogs. Feeding of the gland to delinquent children has not brought about any remarkable results, and was of no value in Mongolian idiocy. Neoplasms of the gland give rise to neurological and metabolic symptoms. The neurological symptoms are found as a result of intracranial pressure, and are identical with those of any tumor

of the midbrain. The metabolic symptoms are, adiposity, sexual changes, and cachexia. The various observers do not agree, and the experimental evidence does not indicate whether or not the pineal body is a ductless gland, and the function of its secretion, or whether the symptoms are due to hypo- or to hyperpinealism. The extract in 1/20 of a grain (0.0032 gram) doses, two or three times a day, is advocated for delinquent children who show no thyroid or pituitary disturbance, but its use is experimental.

L. C. JOHNSON.

COMBY, J.: Acute Encephalitis in Childhood. *Bulletins et Mémoires de la Société médicale des Hôpitaux de Paris*, Feb. 6, 1920, xxxvi, Nos. 5, 6, 7, pp. 161-165.

Lethargic encephalitis has been discussed so fully lately that there is a tendency to forget acute non-suppurative encephalitis in making a diagnosis—especially in children.

The onset of acute non-suppurative encephalitis is sudden—often with fever, vomiting, convulsions, paralysis or coma. After a period, more or less variable, of excitement or comatoid somnolence, resembling lethargy, with or without ocular symptoms, the condition may terminate in death, or in complete cure, or there may be a resulting disturbance in the motor or mental spheres, *e. g.*, choreiform or athetoid movements, paralyses, spasms, insanity, idiocy, epilepsy—some curable, others permanent.

The prognosis is therefore variable and difficult.

Diagnosis rests mainly on lumbar puncture, by which meningitis may be eliminated. In tuberculous or syphilitic meningitis, there is a marked lymphocytosis in the cerebrospinal fluid. In acute encephalitis, there is no lymphocytosis.

In most cases, because of the age of the patient, this condition is mistaken for tuberculous meningitis. There is often an associated somnolence, not unlike that seen in lethargic encephalitis.

S. KAHN.



## SECTION ON ROENTGENOLOGY AND ELECTRO- THERAPEUTICS

HOLMES, G. W.: The Radiographic Findings in Pericarditis with Effusion. *American Journal of Roentgenology*, Jan., 1920, vii, No. 1, p. 7.

From a brief review of the literature, Holmes concludes that there is a rather general agreement among internists and roentgenologists to the effect that with fluid in the pericardium, the cardiac area changes both in size and shape, the shape depending upon the amount of fluid present and upon the position of the patient while being examined.

Since the roentgen findings in any examination are based upon changes in size, shape, density, or movement, and upon the position of the shadows studied, to supplement the roentgen diagnosis of pericarditis when the presence of fluid is not already known and accepted, the author attempts to attack the problem from both the clinical and experimental sides, by considering the following questions: (1) Is the shadow of the heart visible within the fluid-filled pericardium? (2) What effect does fluid have upon the visibility of the heart-beat? (3) What effect has fluid in the pericardial sac upon the slope of the cardiac shadow?

The object of experiment No. 1 was the determination of the appearance of the heart shadow when the organ was immersed in fluids of varying specific gravities. A freshly ligated dog's heart was suspended in a paraffin-coated box, which was filled successively with substances of six different specific gravities; roentgenograms were made of all six preparations on the same plate under identical conditions. The substances used were air, ether with a specific gravity of 0.727, tap water with a specific gravity of 1.000, salt solution with a specific gravity of 1.012, salt solution with a specific gravity of 1.020 and salt solution with a specific gravity of 1.036. Where the heart was suspended in air the outline was sharply

defined; in ether the outlines were not so distinct; in tap water it was just possible to make out the cardiac shadow. In salt solution, showing a specific gravity of 1.092 and 1.020 respectively, it was impossible to identify the cardiac outlines. Where the specific gravity was brought up to 1.036, the heart again became visible, because the heart density was less than that of the liquid. The specific gravity of the living heart filled with fluid was not far outside the range of from 1.012 to 1.020. The specific gravities of fluids removed from the pericardial sac in cases of fluid also varied somewhere within the same range. The author therefore concluded that the roentgenographic demonstration of the human heart in pericardial effusion is most difficult, but that it is still, however, possible.

Experiment No. 2 demonstrates the change in cardiac outline resulting from the injection of 150 c.c. of fresh ascitic fluid into the pericardial cavity of a freshly killed dog. Plates were made with the animal on its back, and these showed that the cardiac outline was more rounded, the cardiohepatic angle was not obliterated, and the heart could not be definitely made out within the shadow of the distended pericardium.

In the third experiment, 200 c.c. of salt solution, with a specific gravity of 1.012, were injected into the pericardial cavity of a cadaver. Plates were taken with the subject prone, and showed that the curves at the junction of the heart and great vessels were straightened out, with no other apparent change in outline. Doing similar work in 1917, Morris and Bader found that the cardiohepatic angle was never obliterated, even after the injection of 1,500 c.c., and that the earliest clinical manifestation was an increase in retrosternal dullness, which appeared at the same time, that the cardiac shadow began to increase in width, and that where the amount of fluid was not too great, it was possible to demonstrate shifting retrosternal dullness, with change of position.

Records of 60 cases, which had been diagnosed more or less positively as pericardial disease, were studied, and fluid was obtained by tapping in only 5 cases, there being serous fluid in 4, and in 1 purulent fluid with a specific gravity of 1.020. All these showed the heart shadow to be much enlarged, with a definite change in shape and in position. Two cases showed faint but distinct pulsation: in the others there was no record of visible pulsation.

The findings of pericarditis with effusion are grouped as follows:

(1) An abnormally-shaped heart shadow, which changes with change of position of the patient (this sign is not present in any other condition).

(2) Obliteration of the normal heart outline.

(3) Changes in shape of the angle formed by the posterior border of the heart, the diaphragm and the spine.

(4) Faint or absent pulsation.

I. S. HIRSCH.

VAN ZWALUWENBURG, I. G.: A Plea for the Use of the Fluoroscope in the Examination of the Heart and Great Vessels. *American Journal of Roentgenology*, Jan., 1920, vii, No. 1, p. 1.

The author states that in the *x*-ray examination of the heart it is not sufficient to merely determine the actual size of the heart, but that it is also necessary to estimate the relative size of the various chambers, to gain some idea of the vigor of the heart-muscle itself, and also to study the heart's relation to the remaining structure of the thorax, not only in a static but in a dynamic sense.

In estimating the relative size of the various chambers of the heart, the superiority of the fluoroscope to the roentgenograph is shown, in that it locates quite accurately two very important points, namely, the point of division between the left auricle and ventricle, and the position of the right auriculodiaphragmatic junction. Neither of these points, least of all the former, can be determined with any degree of accuracy by the roentgenograph.

The author estimates the area of the heart by continuing the upper border of the left ventricle to join the auriculocaval junction in a smooth curve, similarly closing the lower opening of the cardiac shadow. The figure so circumscribed is approximately an ellipsoid, and one may calculate its area by using as the principal dimensions the long diameter and the greatest dimension, which may be erected normal to this line. The product of these values multiplied by  $\pi/4$  (.7854) is the approximate area of this figure. The size of the heart is expressed by the ratio of this area divided by the "norm" for individuals of the same weight. The "norm" is calculated by the following formula: area (sq. cm.) =  $3 \sqrt[3]{\text{wt}^2}$  (lbs.), which ex-



presses the hypothesis that normally the weight of the heart varies directly with the weight of the body and that the comparable areas on similar volumes vary as the cube root of the squares of these volumes.

The estimation of the heart area is especially valuable, in cases with rapid heart action, for determining the minor degrees of dilatation, which occur quite frequently in obvious or latent cases of hyperthyroidism.

The fluoroscope permits the study of muscular weakness of the heart by giving information relative to incoördination, shapelessness, and irregular deviations from the normal. In this connection, by observing the influence of the diaphragm and the anterior chest wall on cardiac movements, it is possible to determine the true location of the apex beat and to note that the left border of the heart only is free and unrestricted in its movement.

By these observations additional value is given to the quantitative knowledge of the roentgenologist in estimating disturbed myocardial function and in detecting the presence not only of major valvular lesions but also of the very important minor lesions.

I. S. HIRSCH.

LUIS Y YAGUE, J.: Heliotherapy in Stomach Troubles. (La helioterapia en los procesos gástricos). *Los Progresos de la Clínica*, January 31, 1920, lxxxvi, 79.

The author has used heliotherapy in the treatment of various gastric conditions. He gives the rules to be followed in administering a sun bath and makes a very minute study of the action of such treatment upon the system. The best results are observed in gastric troubles resulting from a general constitutional condition. He was also able to observe encouraging results in cases of ulcer. The author begins the treatment by local insolation and, little by little, exposes a greater amount of the body surface to the action of the solar rays. Care should be taken that the place where the patient lies during insolation should be free from air currents and sudden cooling. Catching cold should be avoided. The author never begins a treatment when the temperature in the sun is less than 25° C. (77° F), and when the weather is windy the temperature should not be less

than 35° C. (95° F.). The bath should only last from ten to fifteen minutes at first, increasing in duration gradually until an hour or more of insolation is easily tolerated by the patient. If erythema appears the baths should be stopped. After the bath the patient should be dressed rapidly, the abdominal region being covered with a flannel or a cotton cloth next to the skin. During the bath the patient should change his position frequently so as to obtain a thorough exposure of the whole body surface. In cases of painful gastric troubles the abdominal insolation should be of longer duration than that of other parts of the body.

The physiological action of the sun bath is shown by a more rapid gastric peristalsis with relaxation of the pylorus. This produces a certain degree of anesthesia followed by a remarkable appetite, a true sensation of hunger, which is not, however, similar to the painful hunger observed in cases of hyperchloridia. The patient may eat a quarter of an hour after the sun bath.

The author lacks data concerning the action of the sun rays upon the gastric secretion, but the palpable results obtained with this treatment are an increase in the patient's weight, a better appetite, and complete disappearance of all spasmodic pains. The results are very favorable in cases of hyperchloridia as well as in cases of gastritis produced by the abuse of medicines. Cases of ulcer, especially of pyloric ulcer, are remarkably benefited. In these cases heliotherapy should never be applied soon after a hemorrhage. It is wise to let one week elapse after such a complication. According to various authors, solar rays provoke an increase in the number of red blood-cells and in the amount of hemoglobin, and neutrophilic leukopenia with absolute or relative leukocytosis. Heliotherapy also exerts a very marked bactericidal action, which accounts in part for the improvement in the ulcer cases. The author suggests that the sun baths may alleviate the vomiting spells in pregnant women, but he has no experience with cases of this kind.

Heliotherapeutic treatment does not exclude general treatment; it is merely a complement of the latter, and as such it should be taken into account in treating a gastric trouble.

C. F. ARROYO.

DeNIORD, R. E., SCHREINER, B. F., AND DeNIORD, H. H.: The Effect of Roentgen-rays on the Metabolism of Cancer Patients. *Archives of Internal Medicine*, Jan., 1920, xxv, No. 1, p. 32.

The blood chemistry was studied in cancer patients before, one-half hour after, and twenty-four hours after exposure to the *x*-rays. The urea nitrogen was found to be moderately increased in the case of 31 out of 41 patients, after the rays. The uric acid was found to be moderately increased by the treatments, and this increase was attributed to nuclear degeneration and was not considered characteristic of cancer. The sodium chlorid content of the blood was found to be altered neither by the presence of the tumor nor by exposure to the roentgen-ray. The cholesterol, fatty acids and total fats were generally found to be increased in cancer patients. Treatment increased the cholesterol content; the change was attributed to cellular autolysis with liberation of this substance. There was a tendency toward reduction of the fatty acids and total fats by the treatment. An estimation of the blood-sugar and of the diastatic activity of the blood showed nothing that was diagnostic of cancer. The diastase was found to be activated for a short period after the rays. The plasma and corpuscle percentages were unaltered by the effect of the rays, and are of no diagnostic value in cancer.

T. HOWARD.

RIBADEAU-DUMAS, J., MALLET, ET DE LAULIERIE: Pneumoperitoneum and Kidney Radiography. Reviewed in *La Presse médicale*, Mar. 31, 1920, xxviii, No. 18, p. 174.

Hitherto, *x*-rays of the kidneys did not give any very definite pictures. After an artificial pneumoperitoneum with two liters of oxygen, the kidneys appear clearly, and can be carefully studied.

Roentgenoscopic studies under these conditions give a clear picture of the form and size of the kidneys, of anomalies—cystic or polycystic conditions—of tumors, hydronephrosis, ectopic kidney, etc.

S. KAHN.



## SECTION ON NEUROLOGY AND PSYCHIATRY

BOYD, W.: The Winnipeg Epidemic of Encephalitis Lethargica ("Sleeping Sickness," or "Acute Epidemic Encephalitis," or "Acute Infectious Encephalitis"). *Canadian Medical Association Journal*, Feb., 1920, x, 117.

The geographic distribution, the general epidemic behavior and the various clinical pictures presented by this disease are of absorbing interest to the internist, neurologist, pathologist and epidemiologist. The disease, now in one locality now in another, is descending, as the author says, "on the startled community like a bolt from the blue." In this it resembles acute poliomyelitis, a disease which appears suddenly, assumes the proportions of a small epidemic, and then disappears, only to reappear at some remote locality. The explanation in both cases, according to Boyd, is probably the same, namely, that the abortive cases and carriers greatly exceed in number the typical examples of the disease, so that the infection is much more widely distributed than might be expected.

Encephalitis lethargica appeared in Winnipeg in the last week of October, and during the following weeks fresh cases appeared almost every day. In not a single instance could any connection be traced between the different cases, and never did more than a single case occur in any household. Several cases occurred on isolated farms.

The disease is accompanied by fever; it involves the gray substance of the brain stem. The symptoms are usually so typical that there is no difficulty in arriving at a correct diagnosis. Many cases, however, are met with, in which one or several of the usual symptoms are absent, and many examples of what may be considered "formes frustes" occur in which a definite diagnosis cannot be made; the

symptoms are so fleeting and temporary that they excite merely a strong suspicion of the disease.

Boyd divides the cases for purposes of clinical discussion into (1) those with general but no localizing symptoms and (2) those with both general and localizing symptoms. The localizing symptoms may appear early in the disease or not until later. The general symptoms are those of a general infection and they manifest themselves in one or more of the following: fever, lassitude, headache, pain in the back, coated tongue, anorexia, constipation, conjunctivitis and albuminuria or hematuria. In some cases constipation was a marked feature, in others the foul breath and furred tongue gave unmistakable evidence of a general gastro-intestinal disturbance. In one or two cases a severe conjunctivitis was present. These signs of a general infection lend support to the view which the author advances that lethargic encephalitis has been mistakenly regarded as a purely cerebral infection, such as might accompany a brain abscess. It is rather a general infection with a particular invasion of the brain, an infection which may more or less involve parenchymatous organs and which perhaps in some cases may not extend to the brain, giving rise to atypical forms of the disease. This conception of the disease would also agree with that held at the present time in connection with cerebrospinal meningitis, poliomyelitis, and other infections of the central nervous system.

#### SYMPTOMS

The *onset* varies greatly; it may be sudden or very gradual. There may be a distinct prodromal period varying from one to ten days or more, during which the patient does not feel quite well, at the end of which time the classical features of the case make their appearance. In 1 of Boyd's cases the patient felt out of sorts and had a moderate degree of headache for three weeks. At the end of that period she developed a paralysis of the sixth nerve. The spinal fluid was normal. Five days later she became lethargic and developed a bilateral facial palsy. The case was undoubtedly one of lethargic encephalitis, although the onset was so slow as to suggest cerebral neoplasm or cerebrospinal lues. In 2 of his cases the onset was apoplectic in nature, the patients falling to the ground, and in one instance becoming unconscious. Two or three days later they developed the characteristic symptoms of lethargic encephalitis.

The *age* varies between eighteen months and seventy-two years.

*Temperature.*—The temperature varies; there may be no fever early in the disease, and in 1 or 2 of Boyd's cases there was a rise in temperature only when the patient had become dangerously ill. Temperature cannot be considered an index of the progress of the disease; it may vary from 100°-102° F. (37.77° to 38.88° C.) but, toward the end, hyperpyrexia may occur. In the fatal cases observed it seldom, if ever, became normal. In some cases, the lethargy and palsies disappeared in a day or two, but the temperature did not become normal for one or two weeks. This peculiarity in the temperature can, according to Boyd, be reconciled with the fact that the disease is a systemic infection, specially localized in the central nervous system, but involving other organs as well.

*Lethargy.*—Lethargy, although a characteristic feature of the disease, may not be present in every case. It is possible that the lethargy and general weakness are due not so much to the virus as to the peculiar localization of the lesions in the peri-aqueductal region and the midbrain. (In the New York epidemic of the fall and winter of 1919 sleeplessness seems to have been as prominent a symptom as lethargy.—Abstr.)

In some of Boyd's cases the only symptoms were lethargy and fever. In some cases it seemed that most of the lesions involved the cortex of the brain rather than the brain stem. One of his cases was maniacal throughout the entire illness and at no time was he lethargic in the slightest way, but the brain showed the typical lesions of the disease. The lethargy is usually associated with great drowsiness. Curiously enough, insomnia at night is not infrequent, and there may be definite delirium. The lethargy is also peculiar in the fact that no matter how deep it may be, the patient can be easily aroused and will give remarkably clear answers to questions, after which he closes his eyes and relapses into lethargy again.

*Asthenia.*—Asthenia, although considered a cardinal feature of the disease, has not proven itself to be so in Boyd's cases. In some of the cases described in the literature the patients were so weak that they were not able to turn in bed. Many of the author's cases attained this immobility late in the disease, but this was due to mental lethargy rather than to muscular weakness.

*Tremors.*—Marked tremors were observed in several cases. In one of the first cases of the Winnipeg epidemic there were tremors



over the entire body resembling the fibrillary twitchings of progressive muscular atrophy. In other cases a general trembling of the entire musculature appeared, which could be best appreciated when a hand was laid on the patient. One case had clonic contractions of the rectus abdominis at the rate of about twenty to the minute, and lasting for more than two days. (The tremor may simulate that of paresis, multiple sclerosis, paralysis agitans, or chorea—Abstr.)

*Expression.*—In the later stages of the disease the face assumes "mask-like" features. In many cases this is due to lack of emotional tone, but in others the immobility is due to the bilateral weakness of the facial nerves.

*Sensation.*—Disturbances of sensation are not characteristic of the disease. Boyd had 4 cases with severe neuralgic pains in the early stages of classical examples of the disease. In each of these cases there were severe burning pains in the fingers, hand, and forearm, lasting from one to two days, without signs of inflammation or pain on movement or pressure. Headache is a fairly constant symptom, but in many cases it may be entirely absent. (Sensory disturbances may be a prominent symptom of disease. The abstractor has seen in the wards of Mt. Sinai Hospital a case with a level spinal cord lesion and scurvy disturbances.)

*Reflexes.*—The knee jerks may be either absent or exaggerated, and in several cases a positive Babinski (and its confirmatories, *i. e.*, Oppenheim, Chaddock, Gordon, etc.—Abstr.) may be elicited on one or both sides. (In many cases ankle clonus may be obtained—Abstr.) These are all probably due to involvement of the pyramidal fibers as they descend through the internal capsule and mid-brain.

*Paralysis of the Extremities.*—In only 1 of the Winnipeg cases was weakness of the limbs observed. This occurred in a man with symptoms of cortical irritation; after five or six severe jacksonian attacks in the left upper and lower extremities he was left for several days with distinct weakness on that side. In some of the English cases atrophy of groups of muscles followed the disease.

*Mental State.*—Lethargy is the most prominent symptom, but it is not the lethargy of coma or of narcotic poisoning. The patient appears to be plunged in a brown study; there is a tendency to forgetfulness, and it appears as if he has entered on a state of hibernation. And yet in many cases the intellect remains remarkably clear. In many cases, the acuity with which one of these lethargic patients

answers questions after being roused may sometimes startle the examiner. The psychic state seems to be due to a paralysis of emotion and not of ideation, although in the later stages all mental activity seems to be involved. This dissociation of emotional from ideational disturbance seems to be analogous to that observed in cases of progressive lenticular degeneration, or Wilson's disease, and to the dissociation so commonly met with in dementia precox. In several of the author's cases, catatonia has been observed. Dr. Hunter (cited by Boyd) has called attention to the slowly fading smile seen in some cases, this being one of the phenomena of catatonia. (In the New York epidemic many cases have been seen with definite psychoses, manic, and depressed states. The abstractor saw 1 case with a paranoid psychosis, and 1 with memory defects not unlike those seen in Korsakoff's psychosis—Abstr.)

*Cerebral Symptoms.*—When headache is present, it may be frontal or occipital. In a few cases vertigo and giddiness were observed. The author has not seen any cases with cerebellar ataxia. (The abstractor has seen 2 such cases.) When this symptom is present it is probably due to a break in the connection between the superior cerebellar peduncle and the red nucleus. Tinnitus was so common that Boyd came to consider it a diagnostic symptom. Double vision, interference with accommodation, and visual disturbances, were among the most frequent symptoms; photophobia was present in 1 case. In contrast to the lesions of poliomyelitis these symptoms were fleeting and varied from day to day and from hour to hour.

*Cranial Nerve Disturbances.*—Ophthalmoplegia, both internal and external, with diplopia and interference with accommodation, visual disturbances, nystagmus, and ptosis, were of frequent occurrence. They were in the Winnipeg cases, as they have been wherever the disease has manifested itself, the most characteristic feature. Equally characteristic was their transitory nature. The pupils usually reacted sluggishly, and in a few cases not at all.

Involvement of the lower group of cranial nerve nuclei in the lower portion of the pons and upper part of the medulla, namely in those which are in relation to the floor of the fourth ventricle, was frequently observed.

Disturbances of the acoustic nerve (tinnitus mainly) and of the hypoglossal have been not infrequent, but none of the other nerves in the pons and medulla have been involved. Owing to the mental con-

dition of these patients, the trigeminal nerve cannot be tested satisfactorily. Optic neuritis has not been observed by the author in the few cases which he examined.

*Hiccough.*—A few days after the first cases of lethargic encephalitis had begun to appear, a remarkable number of cases of persistent and severe hiccough were reported by the Winnipeg physicians. Some of the patients would hiccough at intervals of a minute or less for five days. In most cases the attack lasted for about forty-eight hours. Over 50 cases of hiccough occurred in the city, and probably many more which have not been reported. A few of the cases have been accompanied by slight fever. Boyd says: "There may be no connection between the two epidemics, but it may be noted that 2 of the cases of encephalitis displayed this symptom at the beginning of the illness."

The *clinical course* and *prognosis* of the disease were as variable as its clinical picture. Some of the cases could be described as fulminating. One little patient died forty-eight hours after the initial symptoms. Other fatal cases lasted only three or four days. The usual duration of the fatal cases was a little over a week. In the cases which recovered, the course was variable. In the milder cases the stupor cleared up after a few days, although a certain amount of lassitude persisted for a considerable period. In some cases, the disease dragged on for weeks, the patient being better one day and worse the next. The temperature curve was not parallel with the clinical condition of the patient. None of the cranial nerve palsies were of very great duration, although in some of the English cases they lasted for three months. All in all the prognosis is better than the alarming appearance of the patient at the height of the illness would seem to indicate. In several cases a fatal outcome seemed to be inevitable, yet the patient recovered. In the Winnipeg epidemic, 23 cases out of 60 died—a mortality of 38 per cent.

*Blood.*—In a few cases there was a moderate leukocytosis, the highest being 16,000; but in the great majority the count was quite normal even when the fever was high. There was no variation in the differential count.

*Cerebrospinal Fluid.*—The reports of the condition of the spinal fluid vary considerably. In some of the Winnipeg cases, the fluid was normal, in others there was a moderate degree of lymphocytosis;



in 1 case there were 154 cells, and in another 210. The condition of the fluid varies from day to day, and apparently bears no relation to the severity of the disease. In many of the fatal cases the fluid was normal. The globulin was either normal or very slightly increased, even in the cases with high cell-counts. The Fehling-reducing power was normal. An inflammation deep in the ganglia or in the center of the mid-brain may leave the meninges untouched and produce no change in the spinal fluid.

#### NATURE OF THE DISEASE

The cause of epidemic encephalitis, although certainly bacterial in nature, is still unknown. Three main views are held at the present time, (1) that it bears a close relationship to, and is indeed a complication of, influenza; (2) that it is a cerebral form of poliomyelitis; (3) that it is a disease *sui generis*.

The Winnipeg experience seems to prove conclusively that there is no etiological relationship between influenza and epidemic encephalitis. The present outbreak is typical in every respect, including the histological findings in the brain, but it is a year since influenza visited the city, and not one of the patients has had a recent attack. Indeed, in a majority of the cases there was *no* history of influenza.

The author admits that there are many striking points of similarity between poliomyelitis and epidemic encephalitis, both clinically and pathologically. This, however, does not necessarily imply that they are one and the same disease. Various different cerebral lesions may produce very similar clinical pictures. Tuberculous meningitis and cerebral neoplasm may be the cause of lethargy, headache, diplopia and cranial nerve palsies. Further, in different diseases the pathological findings may be remarkably similar. The fact that perivascular infiltration and degeneration of ganglion cells are found both in poliomyelitis and epidemic encephalitis does not prove that they are due to the same cause, for practically identical pathological changes are encountered in cerebral lues and in trypanosomiasis, diseases whose etiology is definitely known to be entirely different.

The arguments against the similarity of the two diseases are given by Boyd as follows:

(1) Epidemics of poliomyelitis occur with remarkable constancy in the summer; those of encephalitis have occurred during the winter.

(2) Poliomyelitis is a disease of children; encephalitis is much more common in adults.

(3) In poliomyelitis the paralysis sets in suddenly; its effects are lasting and there is usually muscular atrophy; in encephalitis, the paralyzes come on gradually, they are transitory, and muscular atrophy is an exceptional occurrence.

(4) If the two diseases are identical it is strange that in the present epidemic no cases of spinal poliomyelitis should have occurred.

(5) The virus of poliomyelitis is readily transmitted to monkeys, whereas no cases of satisfactory and undoubted transference have been reported in encephalitis. (The author evidently is not aware of the work done by Strauss and Loewe at the Mt. Sinai Hospital in New York City—Abstr.)

(6) Although the virus of poliomyelitis is introduced intracerebrally in monkeys, the lesions produced are always spinal, never cerebral.

(7) Although many cases of poliomyelitis may show lethargy, even coma, yet when respiratory difficulty sets in, the mental state becomes clear, as pointed out by Peabody, "and the child awakens to the struggle that lies before it." Nothing like this is ever seen in epidemic encephalitis.

(8) Leukocytosis, sometimes as high as 30,000, is met with in poliomyelitis. There is no leukocytosis in encephalitis.

(9) A lymphocytosis, sometimes marked, in the spinal fluid is the rule in the early stages of poliomyelitis; the count is normal or only slightly increased in encephalitis, except in rare cases.

(10) An attack of poliomyelitis is supposed to confer practically complete immunity, so that true second attacks, apart from relapses, are almost unknown. In one of Boyd's fatal cases the patient had had a typical attack of poliomyelitis in childhood which left him with a permanent weakness of one leg.

(11) The ultimate decision, Boyd believes, will rest with the bacteriologist or pathologist. Some of his work in the present epidemic seems to suggest important differences.

#### PATHOLOGY

The pathological changes in the brain do not seem to throw much light on the nature of the disease. Nevertheless, the microscopic

changes found are sufficiently definite to enable one sometimes to make a final diagnosis in an obscure case. In the 18 postmortems in the Winnipeg epidemic Boyd examined the brain in all, and the kidneys in 2 cases.

The *brain* showed marked congestion, perivascular infiltration with lymphocytes and plasma cells, and occasionally hemorrhages. Degeneration of the nerve-cells was variable. There was no definite relation between the vascular and cellular changes. The most inflamed vessels were surrounded by apparently normal nerve-cells, and in places where the cell-bodies were mere shadows, in some instances, no change whatever could be found in the vessels. The affected vessels seemed in most cases to be separated from the brain substance by a clear space of varying width containing numerous erythrocytes which had escaped from the vessel. Boyd and his co-workers could find no evidence of invasion of the surrounding brain matter by cells, as has been reported by other writers. The change in the nerve-cells seemed to be secondary. Distinct hemorrhages were present in some sections, but they were by no means a prominent feature, except in one or two cases where they could be seen with the naked eye.

Meningeal involvement was slight and variable. In many cases none could be found, in others there was a marked degree of infiltration around the vessels. The changes in the spinal fluid are probably directly due to these changes in the meninges.

"It is strange," the author says, "that the literature of the disease is silent on the pathology of the organs other than the brain." In his examination of the *kidneys* he found two chief types of change: extreme congestion of the vessels, most marked in the medulla but also present in the cortex, and great degeneration of the convoluted tubules. In some instances the medullary vessels were so distended that the tubules were entirely obscured; the vascularity was so extensive as to recall at times the edge of an infarct. The parenchymatous changes varied in degree, the picture suggesting the action of some powerful irritant on the renal cortex. The brunt of the attack seems to fall on the vessels and filtering apparatus of the kidney.

Observations are being made on other parenchymatous organs, but results at this writing are not ready for publication. According to the author, "it would appear from the above observations that there is sufficient evidence to show that lethargic encephalitis is not merely



an inflammatory condition of the brain, but a general infection, involving many parenchymatous tissues, in which the brain is the chief sufferer."

All bacteriological investigations have proved negative. Cultures from the blood and cerebrospinal fluid gave no result. Two of the author's co-workers emulsified portions of the brain and injected the emulsion into the brain of rabbits, but without effect. Another co-worker did the same with the cerebrospinal fluid, with a similar result. (The reader is referred to Strauss and Loewe in the *Journal of the American Medical Association*, Oct. 4, 1919. This is a preliminary note of the work done by these observers at the Mt. Sinai Hospital, in New York City. They claim to have isolated a filtrable virus from the nasopharynx of patients suffering from so-called lethargic encephalitis. The organism resembles in morphology, appearance of colonies, and growth, that described by Flexner and Noguchi in poliomyelitis, and has up to date—Oct. 4, 1919—been carried to the twelfth generation.—Abstr.)

M. KESCHNER.

MORAX, V., AND BOLLACK, J.: Visual Disturbances in Encephalitis Lethargica. *Bulletins et Mémoires de la Société médicale des Hôpitaux de Paris*, Feb. 13, 1920, xxxvi, Nos. 5, 6, 7, pp. 199-207.

There are some patients suffering from encephalitis lethargica whose general condition is of comparatively minor importance, the patients' chief complaints being ocular disturbances.

These may be classified as follows:

1. *Disturbances in Extrinsic Motion:*

(a) *Ptosis*.—This is a very common symptom. It appears suddenly, is usually incomplete and bilateral. It is never as marked as the ptosis seen in paralysis of the third nerve.

(b) *Strabismus*.—Deviation of the eye axis is frequent, but usually transitory.

(c) *Ocular Movements*.—When the patient is asked to follow the finger with his eyes, one frequently observes a partial or complete

limitation of certain movements. Since this limitation is usually bilateral and symmetrical, it really falls under the "*paralysis of associated movements*" of Parivaud. In 6 of the 7 cases studied, the paralysis affected the vertical movements of the globe. Of these 6, there was limitation of upward motion in 3 cases, limitation of downward motion in 2 cases, and limitation of both upward and downward motion in 1 case. In 4 cases there was a disturbance in convergence.

(d) *Nystagmus*.—This is an important symptom of encephalitis lethargica. The hystagmiiform movements are very slow, and are usually in the vertical plane.

(e) *Diplopia*.—This is an almost constant symptom. The diplopia is atypical, in that it has none of the characteristics of diplopia resulting from involvement of the third, fourth or sixth cranial nerves alone.

## 2. Disturbances in Intrinsic Motion:

(a) *Pupillary Disturbance*.—The pupils are often unequal in size. In 1 case, the light reflex was lost, due to paralysis of the third nerve. In another, the Argyll Robertson phenomenon was present.

(b) *Accommodation*.—Disturbances in accommodation constitute the most constant ocular symptom of the disease. This, associated with a normal light reflex, markedly resembles the disturbance seen in post-diphtheritic paralysis. It differs from the latter in the longer duration of the disturbance.

3. *Disturbances in Visual Function*.—Sight has never been impaired in the cases studied by the author. The fundus was always normal. The visual fields were never contracted.

4. *Disturbances in Ocular Sensibility*.—Corneal and palpebral sensibility have been found to be normal.

S. KAHN.

NETTER, A.: Lethargic Encephalitis. *La Presse médicale*, Apr. 7, 1920, xxviii, No. 20, pp. 193-195.

*Symptoms and Diagnosis*.—The three cardinal symptoms of the disease are:

- (1) Fever.
- (2) Ocular disturbances.
- (3) Somnolence.

The somnolence and ocular disturbances may be explained by the anatomic proximity of the motor nerves of the eye to the region of the brain involved in producing sleep. This connection was proven in 1875 by Gayet. The proximity of the motor nerves of the eyes to those of the tongue, face and pharynx explains the frequent association of paralyses of these organs when the eye is involved.

Instead of a state of depression, there may be a state of excitement, evidenced by intermittent muscular contractions, twitchings, convulsions, and delirium. Hiccough is frequently an important symptom.

These apparently contradictory symptoms should not cause uncertainty, for histologic examinations of the brains of patients who have died of encephalitis lethargica have shown massive accumulations of embryonal cells around the blood-vessels, together with changes in the nerve-cells. These were less marked than in poliomyelitis.

The *duration* of the disease is variable—from a week to three months or more.

The *prognosis* is difficult to establish. Death occurs in from 20 to 25 per cent of cases. It is often due to an involvement of the vital centers by the disease. Occasionally, death results from an aspiration pneumonia.

The somnolence seen in certain patients with typhoid fever, grip, tuberculosis meningitis and brain tumor, often resembles that of encephalitis. This type of encephalitis, associated with excitement, has been mistaken for simple chorea, mania, electric chorea, etc.

*Examination of the cerebrospinal fluid is valuable.* The cell-count is usually not increased. Occasionally it is markedly raised at the outset. The number, however, rapidly decreases—which is in marked contrast with the count of tuberculous meningitis, which increases. The albumin content is usually normal. The sugar content is increased—probably due to an irritation of Claude-Bernard's center.

The disease was originally believed to be due to an intestinal



intoxication, in which condition ocular palsies frequently occur—e. g., botulism. This view has been discarded because of the usual absence of fever, and of the type of depression—usually coma—in botulism, and because all individuals of a group are usually stricken at once in cases of food-poisoning.

Encephalitis lethargica is a specific disease, the causative factor of which has a selective affinity for a certain portion of the brain. It differs essentially from other diseases which involve the same tissues and produce similar symptoms—e. g., trypanosomiasis, poliomyelitis and encephalitis following certain cases of grip.

Encephalitis lethargica is not a new disease. In 1712, Cameraarius described a "*Schlafkrankheit*" similar to that now so frequently seen. Classical authors also mention a lethargic disease, with symptoms resembling those of encephalitis. Thus, the disease has always existed. It is more frequent in occurrence at certain times, when cosmic influences in some way augment the virulence of the causative agent. This usually occurs during cold periods—as does influenza—thus accounting for the simultaneous epidemics of these diseases.

*Treatment.*—The methods to be employed may be summarized as follows:

(1) Urotropin is valuable.

(2) Serotherapy, with serum from patients cured of the disease, is of no use.

(3) Sialogogues, as, for instance, *jaborandi* and *pilocarpin*, are of some value. Netter has observed some enlargement of the parotid glands in several cases, and a profuse siallorrhea in others. He believes that the pathogenic virus exists in the saliva, and that profuse salivation would tend to rid the body of much of the toxin.

(4) Salvarsan and neosalvarsan, which have been recently used in so many diseases, are of no value in encephalitis.

(5) In severe cases, Netter produces a *sterile abscess* by the subcutaneous injection of *turpentine*. The reasons for the beneficial effects of this treatment are not clear, but it has been empirically found to be of value. In certain cases of grip and bronchopneumonia, also, abscess formation gave excellent results.

S. KAHN.

NETTER, A.: Recrudescence of Epidemic Lethargic Encephalitis. (Recrudescence de l'encéphalite léthargique épidémique), *Bulletin de l'Académie de Médecine*. Paris, lxxxiii, Jan. 6, 1920, No. 1, p. 45.

The author states that he considers it very important to pay more attention to the problem represented by the epidemic of lethargic encephalitis in France. He says that in less than six weeks he has diagnosed 12 cases of the disease and has heard of 20 others. Of the three cardinal symptoms, the more constant were fever and somnolency. The third symptom, diplopia followed by a transient palsy of accommodation, was absent in a third of the cases. Netter observed 3 instances of involvement of the hypoglossal nerve, and 2 of involvement of the facial nerve. Three patients exhibited shivering, but only 1 had convulsions. Twice he noted a very marked sialorrhea. The motor centers of the eye did not seem to be as deeply affected as in former cases.

C. F. ARROYO.

CONE, S. M.: Macroscopic Appearance of War-injured Nerves. *Journal of Pathology and Bacteriology*, Oct., 1919, xxiii, 69-77.

The paper is a discussion of conditions in cases in which operations were performed to remove the dense mass surrounding and compressing the nerve. The conditions were sutured nerves, nerve-bulbs, and constricted nerves. There is a formation of young connective tissue which makes the tearing away of the old injured nerve from the scar tissue very difficult. At operations a scar tissue was frequently found which was very translucent and circumscribed, easily dissected from its surroundings, exactly like nerve-bulbs, and called "nerve-callus." Nerve-callus always indicates nerve injury. Occasionally a completely severed nerve was found. It was grey, shrunken, homogeneous and devoid of linear striation. Microscopically it showed long strands of flat-ended nuclei. A condition of hyperplastic neuritis was also found—a chronic inflammation only distinguishable from the usual chronic neuritis microscopically.

F. HULTON-FRANKEL.

# INTERNATIONAL MEDICAL DIGEST

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# INTERNATIONAL MEDICAL DIGEST

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## SECTION ON GENERAL MEDICINE

STRAUSS, S. G.: Thyroidal Constipation. *New York Medical Journal*, Feb. 14, 1920, cxi, 280.

Strauss remarks that there are some cases of constipation in which, in spite of the removal of the supposed organic or functional cause, and after the orthodox medicinal and hygienic treatment, the patients do not seem to obtain any relief. In such cases it is invariably found that there is an important constitutional factor at the base of this local manifestation of inadequacy. To determine this factor it is necessary to study not the patient's bowels and his defecatory difficulties, but his individual make-up. This, the author thinks, can best be accomplished by analyzing the patient from an endocrinological point of view.

Throughout the literature abundant reference is made to thyroid therapy for the cure of various forms of constipation. Thyroid extract, in whichever way it may be administered, will never be a remedy for constipation unless by its administration the constitutional defect can be corrected. The predisposition of the individual to an abnormal metabolic state, one of the manifestations of which is constipation, must be altered. In this connection the author recalls that the thyroid gland in the human physiology seems to act, not alone by virtue of its own inherent qualities, but by its peculiar ability to activate and coördinate the functions of the other endocrine glands. If this interdependence of the glands of internal secretion is borne in mind, it becomes self-evident that we may achieve good results from thyroid therapy, inasmuch as we have indirectly stimu-

lated a gland other than the thyroid to greater activity through our efforts, while the patient's thyroid gland remains normal.

Clinical study, according to Strauss, shows that various qualitative and quantitative physical stigmata are characteristic of thyroid imbalance *per se*. These have not as yet been corroborated in the laboratory, but they are nevertheless of great value clinically, and when combined with constipation call for special thyroid therapy.

These thyroidal indications are manifested as follows:

*Mental Signs.*—There is sluggishness, at times alternating with sparkling wit, and irritability which is aggravated at any slight opposition. General moodiness and irritability are present, inability to concentrate, forgetfulness, fatigue on the slightest mental or physical exertion, lack of confidence, and dullness in the morning, which has a tendency to wear off as the day goes on. Too much sleep is required.

*Hair.*—The hair is usually coarse and dry, with a tendency to come out. It lacks brilliance and looks dusty; there is a tendency to dandruff (and to baldness.—Abstr.).

*Head.*—There is generalized dull headache on slight effort, localized in the frontal or occipital region.

*Eyes.*—The eyebrows are scanty, especially the outer third. There is scaliness of the skin under the eyebrow, and puffiness of upper lid, particularly of the outer half. The eyelash growth is sparse. There is a tendency to enophthalmos (sunken eyes). The eyes are dull, the iris usually pigmented hazel or grey green, being rarely of a clear color such as brown or blue. The pupils tend to be contracted.

*Nose.*—There is a tendency to rhinitis, and frequent formation of crusts.

*Ears.*—The skin of the external ear is dry and scaly.

*Mouth.*—The lips are dry, and crack easily. The tongue is thick and stubby, with imprints of teeth along its margin.

*Teeth.*—The teeth are heavy, soft, easily becoming carious; there is a tendency toward a dirty yellowish color, and liability to pyorrhea.

*Tonsils.*—The tonsils are usually enlarged, with a tendency to frequent attacks of inflammation.

*Respiratory System.*—Such patients catch cold easily, and recover with difficulty. There is a tendency to winter bronchitis with



excessive expectoration. Overgrowth of adenoid tissue is likely in children.

*Cardiovascular System.*—The cardiac rhythm is regular and sluggish, and is not easily affected by physical or emotional stress. The rate is about 60. The systolic pressure is unchanged, but the pulse-pressure is usually less than normal. The extremities are cold, and may be damp. The capillary circulation is poor. There is no stimulating reaction after a cold bath. The patient feels much better in warm weather. Vasomotor and pilomotor skin reactions are sluggish or absent. Temperature is usually subnormal.

*Digestive System.*—The appetite varies, and is capricious; there is a craving for sweets, a tendency to tasteless, gaseous eructations after meals, frequent meteorism and offensive flatus. Such patients have a tendency to thickening and varicosities of the rectal veins, with bleeding. They show a desire to sleep after eating. There is a tendency to gain weight rapidly.

*Urinary System.*—There is a tendency to polyuria and nycturia. Nocturnal enuresis is common. Traces of albumin and sugar are found in the urine. There is excessive indican.

*Skin.*—The skin is dry, thick, scales easily, and frequently shows patches of psoriasis and eczema; there is a tendency to small verrucous (warty) growths. The patient perspires with difficulty. The skin has a yellowish, earthy color. The fingers and toes are often blue, the nails thick, and fragile, with ridges.

*Skeleton.*—One observes relaxation of the ligaments. A crackling noise is heard on motion of the small articulations.

Having determined that a given patient with constipation may be included in this symptom group (and that there is no other removable cause for the constipation—Abstr.), the careful clinician must face the problem of readjusting and accelerating the individual thyroid tonus to its normal function. Strauss begins with 1/10 grain (0.0064 gram) of thyroid extract, given on an empty stomach, either in the morning on awaking, or on retiring at night. This is continued once a day for a week and the results noted. Although the constipation may not yield immediately, one or more of the other symptoms of thyroid dysfunction may be improved or cured. If this is the case, the same routine must be repeated for another week, since it shows that the patient is improving generally. Severe con-

stipation may persist to the last and need not discourage the patient or physician. If it is found that the small dose has no effect, it should be increased in quantity, but administration once a day is all that is necessary. From 1/10 grain the dose is increased to 1/2 grain (0.0324 gram) then to 1 grain (0.065 gram) and so on. What the proper quantity will be cannot be predicted at the beginning of the treatment. It is best to obtain the freshest preparations (from reliable pharmacists—Abstr.) inasmuch as all animal extracts deteriorate with age.

While undergoing this treatment, the patient lives as he wishes. Cathartics and laxatives are strictly prohibited. If no movement occurs within thirty-six hours a small saline enema may be used. No dietary restrictions are necessary. As soon as the intestinal action is normal, the thyroid medication is stopped and not repeated unless the symptoms of thyroid dysfunction recur.

M. KESCHNER.

LABBE, M.: Acidosis in Acute Abdominal Infections. Proceedings of the *Académie de médecine de Paris*, April 6, 1920; Reported in *La Presse médicale*, April 10, 1920, xxviii, No. 21, p. 208.

Acidosis is rare in the course of general infections, but it is very frequently encountered in acute inflammations of the abdominal viscera, especially appendicitis and cholecystitis. In these cases, the intensity of the acidosis varies directly with the intensity of the inflammatory process. It ceases with a disappearance of the inflammation, and reappears with relapses.

The acidosis in these infections is not due to starvation, to operative interference, or to the anesthetic. It is due to some liver disturbance, resulting from the infection. This is shown by the coëxistence of the acidosis with evidence of hepatic changes—e. g., urobilinuria, amino-aciduria, etc.

The presence of the acidosis in abdominal infections, especially, is explained by the proximity of the inflammatory processes there to the portal vein.

S. KAHN.

SAVIGNAC, R., AND ALIVISATOR, A.: Case of Intolerance toward Emetin with Urticaria. Study about Emetin Elimination (Un cas d'intolerance a l'émetine se traduisant par des poussées d'urticaire. Contribution a l'étude de l'élimination de l'émetine). *Paris médical*, Jan. 10, 1920, x, No. 2, p. 43.

The authors give the history of a case of urticaria in a patient treated with emetin for chronic dysentery. The urticaria rash did not appear until after the second series of injections of emetin had been begun, as if the patient had been sensitized by the first series of injections. The rash appeared on limited areas and changed from one region to another. The intensity of the rash was very variable. The authors were compelled to substitute treatment with calcium chlorid for the emetin treatment, with which they were obtaining good results in combating the dysentery. The rash continued to appear afterwards, but ceased gradually.

The authors attribute the urticaria to the use of emetin, inasmuch as the patient never before presented any such rash, the rash reappeared each time an injection of emetin was administered, and disappeared as soon as the emetin was discontinued. Job and Raillet report similar cases of intolerance, and the latter suggests the following rules to avoid the appearance of the rash: The emetin solution must be non-acid, the injection must be given intramuscularly and very deeply, and care must be taken that not a drop of the liquid gets under the skin. The authors followed these rules, but urticaria was produced nevertheless.

Emetin is chiefly eliminated in the urine and its presence in this excretion can be easily detected. The authors describe four different methods for detection. The process is similar in all of them. After treating the urine with acetate of lead, chloroform and ether are applied; after evaporation, a yellow residue remains. The emetin is detected in it as follows:

(a) By means of Bouchardat's reagent, which gives a chocolate-colored precipitate.

(b) With the reagent of Mayer-Valser (a solution of potassium mercury iodid), which gives a milky precipitate.

(c) With Petoni's reagent (a solution of permanganate of potassium in sulphuric acid), which gives a purple coloration.



(d) With ammonium molybdate, which gives a green coloration that changes to indigo in half an hour.

In the cases studied the urine was examined at frequent intervals, and the results were widely variable. Sometimes the urine was negative, and sometimes positive for emetin.

The results did not correspond at all with the injections or with the appearances of the rash; also it seems that when the rash appeared the urine was negative. The elimination seems to be very slow, for three months after the last injection the urine was still positive. The authors give a chart containing all details.

C. F. ARROYO.

COMBY, I.: General Review of the Treatment of Acute Appendicitis. *Archives de médecine des enfants*, Feb., 1920, xxiii, No. 2, p. 112.

Comby summarizes the discussions at the Academy of Medicine (July, 1919, and Oct. 21 and 28, 1919). Temoin, whose practice is largely rural, was in favor of immediate systematic operation and drainage in every acute case, regardless of the length of time since the onset. For 1175 acute cases he has observed a mortality rate of 3.5 (3.1 per cent—Editor), the details being distributed as follows:

560 cases with lesions limited to the appendix . . . . .	1 death
281 cases with encysted intraperitoneal abscess . . . . .	3 deaths
165 cases with peritonitis limited to pelvis . . . . .	8 deaths
169 cases with generalized peritonitis . . . . .	25 deaths

Hartmann is also an immediate interventionist. A. Jalaquier opposed the method and recommended immediate operation only during the first thirty-six hours of the illness; he advocated watchful waiting in other cases. The mortality rate in his cases was also 3.5 per cent. Tuffier, Quenu, Bazy, and Walther are also opportunist. The conclusions drawn are that in cities and in good hospitals it is advisable in late cases to wait until the acute attack is over and then to operate, while in the country districts immediate operation in all cases, regardless of time, produces the best results.

W. C. DAVISON.

WILCOX, W. H.: The Treatment and Management of Diseases due to Deficiency of Diet. *British Medical Journal*, Jan. 17, 1920, No. 3081, p. 73.

The careful study of scurvy and beriberi in Mesopotamia, and the success of scientific rationing of the troops, establishes definitely that these are deficiency diseases, and that specific vitamins were lacking from the food. Scurvy was limited to the Indian troops, while beriberi occurred only among the British soldiers. Eleven thousand four hundred and forty-five cases of scurvy developed in the army at the front during the last six months of 1916; these men had not been able to obtain any fresh meat or vegetables for nearly a year. When proper facilities for transport were developed, the number of cases dropped remarkably. Fresh beef juice was found to be decidedly antiscorbutic, as was lime juice when it was delivered within three months from the time it was prepared. For the same reasons the British soldiers acquired beriberi, and as soon as they were given an extract of yeast in their rations, they no longer succumbed to this disorder.

L. C. JOHNSON.

HILL, L.: The Nature, Prevention, and Treatment of Heat Hyperpyrexia. The Physiological Aspect. *British Medical Journal*, March 20, 1920, No. 3090, p. 379.

Heat-stroke results from the rise of body temperature to a height incompatible with the maintenance of the equilibrium of the physico-chemical reactions in the cell on which life depends. It may occur in either dry or moist heat, and the effect of enclosure and still air is very important. In warm stagnant air the emergency method of cooling by sweating is brought into play, and since the cooling powers of still air are very low, the importance of moving currents of air is evident. In the desert, so long as the skin is wet with sweat, most of the solar heat is expended in the evaporation of the sweat. But if the skin becomes dry, absorption of the sun's heat takes place, and the temperature of the blood is raised. The Arab crouches down on the ground, and covers himself with clothes, to avoid the drying and heating effect of the simoon. In the case of

dark-skinned natives, the pigment absorbs heat, the nerve-endings are heated, and dilatation of the skin-vessels, and sweating, result. Exposure to the sun greatly increases the strain on the sweating mechanism, and hence soldiers heavily clothed, marching in close formation on a hot day, are under ideal conditions for the production of heat-stroke. White men in the tropics should tan their bodies so that they may wear light clothing. The direct cause of heat-stroke in a hot dry atmosphere seems to be exhaustion of the sweating mechanism, and those in danger of heat-stroke show a dry skin. The best treatment is artificial sweating, by spraying the skin with water and agitating the air with fans. In the final stage of heat-stroke, the quick breathing washes the  $\text{CO}_2$  out of the tissues, thereby increasing their alkalinity. There is no acidosis, and no indication for the intravenous injection of alkalis. Cramer's experiments on animals show that infection and a hot atmosphere may have an accumulative effect in producing heat-stroke by over-stimulating and exhausting the adrenal action. Observations on lower animals show that death from excessive heat is due neither to coagulation of proteins nor to want of oxygen, for the change produced by heat is reversible, if it is not carried too far, and is not affected by increased oxygen tension.

L. C. JOHNSON.

WILLCOX, W. H.: The Nature, Prevention, and Treatment of Heat Hyperpyrexia. The Clinical Aspect. *British Medical Journal*, March 20, 1920, No. 3090, p. 392.

The etiological factors are:

(1) Climate, the country around the Persian Gulf being particularly dangerous, in that it is flat, devoid of shade and vegetation, and that the soil radiates and reflects to a great extent the sun's rays.

(2) Temperature. A maximum shade temperature of 110 is the danger limit, and the cumulative effect of protracted periods of heat has been noted.

(3) Humidity, on account of the diminished heat loss by evaporation from the skin, and the greater heat conductivity of hot damp atmosphere.



- (4) Stagnation of the air.
- (5) High night temperature.
- (6) Race, the white soldiers being particularly prone to stroke.
- (7) Age, the mortality being greater over forty years.

The predisposing factors are:

- (1) Alcohol.
- (2) Exertion.
- (3) Constipation.
- (4) Diseases causing pyrexia, particularly malaria.
- (5) The enteric diseases.
- (6) The absence of a large supply of drinking water.

Preventive measures consist in thick-walled dwellings, and the use of fans, light, loose, clothing, not too thin, and attention to general health measures.

No characteristic pathological findings were found, but edema and general hyperemia of the brain were noted, and cloudy swelling of the liver, kidneys, and myocardium. Petechiæ of the skin and mucous membranes were seen in a few cases.

Clinically, four types of disturbance were noted: (1) heat exhaustion, or the mild type; (2) the gastric type; (3) choleraic or gastro-intestinal type; and (4) heat hyperpyrexia, or heat stroke. In the *first group*, the fever was low, or subnormal temperature was noted, the mortality was low, and the duration of the attack was short. In the *gastric type*, there was flushed face, moderate fever, and nausea and vomiting. These cases, after from four to ten days, often passed into the hyperpyrexial type. Absence of the knee-jerk was noted as an early diagnostic sign, the reflex returning during convalescence. In the *gastro-intestinal type*, fever was low, there was the general appearance of cholera, and in many cases death occurred early. *Heat hyperpyrexia* comprised 72.5 per cent of the cases in which the onset was sudden or prolonged; very high temperatures were noted, and the convalescence was protracted. The exhaustion cases were treated only by rest, keeping cool, and aperients. The gastric type required great care; purgation was employed, bicarbonate given in large doses, the fat and protein in the diet being reduced. The choleraic cases were treated like cholera, including normal or hypertonic saline subcutaneously. In addition

to the usual procedures recommended for the hyperpyrexial type, venesection, with withdrawal of from 10 to 20 ounces of blood, was employed with success for convulsions.

L. C. JOHNSON.

RIBON, V.: Differential Diagnosis between the Different Kinds of Meningitis and Malarial Meningism by Means of Examination of the Ocular Fundus (Diagnostico diferencial entre las diversas meningitis y el meningismo palustre por medio del examen del ojo.) *El Siglo médico*, Madrid, Feb. 16, 1920, No. 3451, p. 86.

The author says that it is very important to differentiate between a true meningitis and meningism without real meningeal involvement. This is most important in the regions where malaria is prevalent. The reason for the great number of cases of *cured meningitis* reported in the malarial cities of Colombia is the lack of a good method of differential diagnosis. When the laboratory tests and lumbar puncture fail to give us the clue, the eye fundus may reveal signs of the greatest usefulness. The ocular findings in true meningitis and in meningism are as follows:

*Acute Meningitis*.—Optical neuritis is very common. The consequence is papillary atrophy and blindness in the eye affected. Some times a paralysis of the cornea is observed.

*Epidemic Cerebrospinal Meningitis*.—The veins are engorged, there is optical neuritis, as in the above case, and numerous hemorrhages of the retina. There is also thrombosis of the central vein of the retina, and sometimes suppurated iridochoroiditis that may cause atrophy of the eye-ball.

*Tuberculous Meningitis*.—The phenomena are in the beginning merely inflammatory, such as iritis, nystagmus, miosis, and strabismus by contraction of the inflamed motor muscles. Later on the signs are paralytic mydriasis, ptosis, and strabismus by palsy, also anisocoria. Sometimes the ophthalmoscope is able to detect some miliary tubercles in the vicinity of the optic nerve and disc.

*Malarial Meningism*.—This includes amblyopia and amaurosis, retinocoroiditis, keratitis, conjunctivitis, neuralgia of the supra-orbi-

tary nerve, accompanied by a slight tumefaction of the upper lid. The ophthalmoscope will detect a deep ischemia of the retinal vessels, caused by temporary obstruction. There may be a temporary blindness caused by a hemorrhage near the papilla or in the ciliary process. There is the typical malarial neuroretinitis with inflammation, edema and gray discoloration of the disc. The veins are tortuous and the arteries thin. Optic atrophy may occur.

The author thinks the ocular data may complete the laboratory findings, rendering the differential diagnosis between true and false meningitis more definite.

C. F. ARROYO.

BASS, C. C.: Malaria. Its Treatment and Control. *International Clinics*, 29th series, 1919, iv, 1.

The author bases his mode of treatment of malaria on the following well-known facts:

(1) The adult plasmodium malarie is destroyed in the blood of a patient who has been saturated continuously for forty-eight hours with quinin.

(2) The spores of malaria can live indefinitely in the blood of patients, regardless of the amount of quinin taken.

(3) Spores remain latent in the presence of quinin in the blood and begin to develop into plasmodia only after the drug has been entirely eliminated from the system.

(4) It takes seven days for the spores to develop into adult spore-bearing plasmodia.

(5) Quinin must be absorbed in order to do its work, hence the necessity for a preliminary cathartic, a soup diet, and hot water taken with the quinin.

(6) The blood must remain continuously saturated with the quinin, hence the importance of administering the remedy regularly night and day.

(7) The total amount of quinin necessary is very small.

In the treatment of malaria Bass warns of the necessity of carrying out every step in detail. On the evening before beginning the use of quinin, he gives a cathartic, preferably 2 ounces of castor oil



in beer-foam or ginger ale or root beer; or 5 grains (0.324 gram) of calomel with 10 grains (0.65 gram) of sodium bicarbonate and a Seidlitz powder in the morning.

During the entire treatment, the patient's diet is to consist only of hot soups. On the morning after taking the cathartic he receives 2 grains (0.13 gram) of bisulphate of quinin or of the muriate—preferably the former—with half a pint of hot water every two hours, night and day, for two full days and two full nights. If necessary an alarm-clock is to be utilized, as missing one or two doses will render the treatment useless.

The soups should be very nutritious, such as rich vegetable soups, milk, rice or barley soups.

No quinin is then given for six full days and six full nights. On the evening of the sixth day another cathartic is to be taken. On the morning of the seventh day the quinin is taken again as before, for two full nights and two days. Then it is to be stopped, a simple tonic ordered, and precautions taken to keep away mosquitoes that have bitten others suffering from malaria.

The quinin may be administered in solution or in capsules, but in the latter case the cap is to be removed from the capsule before it is swallowed.

In the interval of six days between the two courses of quinin therapy it is well to order a pill containing 1/50 grain (0.0013 gram) of arsenious acid one hour before and after each meal, each time with a full glass of hot water.

If the quinin is not well borne by the patients, from 2 to 5 grains (0.13 to 0.324 gram) of sodium bromid in a little hot water may be administered before each dose of quinin.

M. KESCHNER.

WESSLER, H.: Suppuration and Gangrene of the Lung. *Journal of the American Medical Association*, Dec. 27, 1919, lxxiii, No. 26, p. 1918.

Wessler reports a series of 100 cases of suppuration of the lung. He lays down as a premise his conception that bronchiectasis, lung abscess and gangrene of the lung should not be regarded as separate conditions, inasmuch as they are practically always associated to

some degree. He prefers to consider the subject under the comprehensive heading of lung suppuration. His series includes 21 cases following tonsillectomy, 5 following other operations, 37 post-pneumonic cases, and 21 of insidious origin, such as colds and grip. The remaining cases comprise a considerable variety, such as aspiration following submersion, coma, the inspiration of foreign bodies, and infection secondary to a considerable number of other diseases. In calling attention to the large number following operations on the tonsils, the author expresses his belief that these are due to small plugs of infectious material combined with blood, which are forcibly inhaled during the operation. He describes the subsequent process as a localized bronchitis which is destructive and gangrenous, with weakening and dilatation of the bronchial wall. The cavity may be single and large, or there may be a number of small communicating cavities, and the condition may spread to involve the entire lobe. There is, from the first, a tendency to induration of the lung. The postoperative aspiration abscesses appear twice as often in the upper lobe, while the pneumonic cases attack the lower lobe in about the same proportion. Wessler points out the significance of a two-weeks' period of foul expectoration following operation before the appearance of the symptoms of abscess. The patients may have a slight hemoptysis, and usually have persistent fever. He says: "The presence of clubbed fingers may be of help in the diagnosis. They develop relatively early in the course of bronchiectasis, at times as early as six weeks, though usually in a few months. On the other hand clubbing develops only in longstanding cases of pulmonary tuberculosis." Roentgenographic examination is essential, as the physical signs in small abscesses are notoriously difficult to elicit.

The prognosis of the postoperative aspiration cases is most hopeful, 9 of the author's series recovering spontaneously and a cure resulting within two months. Cases which proceeded beyond this time went on to a chronic stage and later developed the usual complications. He points out that remission of symptoms may prove deceptive, as recurrences are quite apt to appear. Hemoptysis is more common than in pulmonary tuberculosis, and is not infrequently fatal. The prognosis of the pneumonic cases appears to be almost absolutely bad. Medical treatment offers little that is encouraging; relief of the cough should be attempted, and posture to facilitate drainage is of value. Discussing the operative treatment,

Wessler says that a knowledge of the pathology of lung suppuration teaches us that the only hope of complete cure rests in the complete removal of the infiltrated lung. He discourages artificial pneumothorax as illogical, as the mere collapse of a gangrenous cavity will not remove the focus. Two patients in the case of whom it was tried died suddenly. He emphasizes the value of bronchoscopy, both for diagnostic and therapeutic purposes, and urges that normal studies of etiology may throw light upon the treatment.

H. G. WEBSTER.

MEAKINS, J.: Harmful Effects of Shallow Breathing, with Special Reference to Pneumonia. *Archives of Internal Medicine*, Jan. 1920, xxv, No. 1, p. 1.

A study of 4 cases of pneumonia showed that with an increasing respiratory rate there was an increase in the amount of oxygen in the alveolar air, a stationary or slightly decreasing  $\text{CO}_2$  content, and an increasing respiratory quotient. The author believes that the rapid, shallow, respirations in pneumonia result in a decrease in the blood-oxygen, and that this factor usually precedes and is responsible for the terminal cyanosis and circulatory failure. This conclusion is reached as a result of the application to his findings of the observations of Haldane, Meakins and Priestly to the effect that in shallow breathing the increased ventilation of the well-ventilated parts of the lung is incapable of supplying an excess of oxygen to the blood sufficient to compensate for the lack of oxygen from the poorly-ventilated parts of the lung. The relatively decreased amount of oxygen absorbed thus results in an actual increase in the oxygen in the expired air. The dissociation curve for  $\text{CO}_2$ , however, is totally different from that of oxygen, and it is possible for the diminished removal of  $\text{CO}_2$  in the poorly-ventilated portions of the lung to be compensated for by an increased removal in the well-ventilated portions. Anoxemia begets shallow breathing, and thus a vicious circle is established. It is suggested that a break in this vicious circle may provide a chemical explanation for the sudden change in condition on the occurrence of the crisis.

T. HOWARD.



GINSBURG, S.: Reflex Phenomena in a Recent Series of Influenza Cases. *Medical Record*, Jan. 17, 1920, xevii, 98.

During the height of the epidemic, when large numbers of patients were examined daily, two chief characteristics among the unique clinical features of the disease impressed themselves upon Ginsburg in connection with the influenza cases. These two characteristics distinguished them from the ordinary cases of grip.

The two chief characteristics were: (1) the almost constant presence of pleuropulmonary involvement in every case of pandemic influenza, no matter how mild the clinical course of the disease, (2) the almost invariable accompaniment of reflex phenomena in the neck, chest, abdomen, or back, whenever pleuropulmonary involvement was found on physical examination at some time during the course of the disease.

It was remarkable to find that patient after patient, on the first day of the disease, complained of reflex pain with no pulmonary signs, and later developed pleuropulmonary signs in accordance with the reflex phenomena. It was this frequent association of reflex phenomena with pleuropulmonary involvement which caused Ginsburg to be extremely careful in diagnosing myalgia, neuralgia, pleurodynia, or lumbago as a clinical entity, even in the absence of definitely demonstrable disease in a viscus. Frequently, on further observation of the case, he was able to find evidences that a diseased viscus was responsible for the visceromotor and viscerosensory phenomena.

M. KESCHNER.

BURROWS, W. F., AND BURROWS, E. C.: Influenza. A Confirmatory Report upon the Abortive Action of Quinin Dihydrochlorid. *Medical Record*, Feb. 7, 1920, xevii, 235.

The treatment of influenza with quinin dihydrochlorid was, in the hands of the authors, equally efficacious at all ages. Their youngest patient was four years old, their oldest sixty-three. They gave injections of this drug at any time from the first to the sixth day of the disease and also where definite pneumonia was a complication. They emphasize the importance of early injection, because in their

experience the drug has no specific action upon the secondary pneumonias.

In influenza with temperatures ranging between  $101^{\circ}$  and  $106^{\circ}$  F. ( $38.33^{\circ}$  and  $41.11^{\circ}$  C.) and a pulse rate up to 120, the patients obtained relief within a short time after the injection. There was a drop in temperature and pulse-rate, the facies improved, the tongue became moist and the feeling of anxiety seemed to have disappeared. Without other treatment the cough was diminished.

These authors use a 10 per cent solution of the drug. To an adult they give from 15 to 22 grains at once (0.972 to 1.425 grams). At least one-third, often one-half, and occasionally the full dose is administered intravenously. The remainder is injected into the biceps muscle. For young children from 7 to 10 grains (0.46 to 0.65 grams) is the dose. A general sensation of tingling and warmth accompanies the injection; sometimes a slight chilly feeling and a fleeting pallor or nausea may occur if the injection is given too rapidly.

M. KESCHNER.

BRIZ, B. H.: Influenza (La grippe). *El Siglo médico*, Madrid, Feb. 16, 1920, No. 3451, p. 85.

The author was in charge of the health of the children in several schools and children's homes in Madrid. During the last influenza pandemic he had under his care 400 patients, with 23 cases of bronchopneumonia and a total mortality of 7. In the benign cases he used salipyrin, obtaining very good results. In some cases he replaced it by quinin sulphate, which was especially effective in the prodromal stages of the disease. The most remarkable symptom was epistaxis followed by the disappearance of headache and fever. He treated the 23 cases of bronchopneumonia by injections of diphtheric antitoxin. Only 7 patients died, all of whom were tuberculous. Four other tuberculous patients died, after recovery from influenza, as a consequence of pulmonary hemorrhage. As heart stimulants Briz used camphor in oil and strychnin. Immunity seems to last only a short time, some of the patients suffering two or three attacks of the disease. He complains of the lack of knowledge of the etiology of influenza.

The author repeated the experiments carried out by the United States Navy, with negative results. In some cases all the occupants of a dormitory, from 60 to 70, would fall sick almost simultaneously, and the author considers that this can be explained by admitting that contagion is carried by the air.

C. F. ARROYO.

MINET, J., AND LEGRAND, R.: Heart Influenza (La grippe cardiaque). *Paris Médical*, Paris, Feb. 14, 1920, No. 7, p. 133.

The authors express their surprise regarding the lack of data referring to this well-defined syndrome. Most of the literature dealing with influenza merely states the fact that some cardiac lesions are present as secondary accidents in the course of the disease. But sometimes the cardiac lesion is single and clearly primary. The authors discuss the histories of 6 cases of simple cardiac involvement in influenza, and describe in detail the different syndromes provoked by the primary invasion of the heart. The symptoms vary greatly according to the extent and localization of the lesions. The authors studied the following symptom complexes:

*Pericardial Syndrome.*—This is divided into two varieties, dry pericarditis, and pericarditis with effusion. Both forms are similar to the forms of pericarditis observed in other infectious diseases. The effusion may reach a considerable volume; Grasset reports a case with 700 c.c. of liquid. This syndrome is very often accompanied by invasion of the myocardium.

*Endocardial Syndrome.*—This is usually accompanied by an organic lesion. It generally appears during the grip attack or during convalescence, the prognosis being more serious in the latter case. All valvular orifices may be involved, but most frequently the involvement confines itself to the left heart. Both valves of this side may be involved. This endocarditis is always insidious at the beginning, and the attention of the physician is first called by an increase of dyspnea and palpitation. This syndrome generally ends in death, and the patients who do recover keep for life a serious valvular lesion. Endocarditis never appears alone; there is always pericarditis or myocarditis.



*Myocardial Syndrome.*—This is very frequent, but is usually detected only at autopsy. The classical clinical signs are: precordial pain, weak sounds, and arrhythmia. Huchard, who first called attention to the influenzal involvement of the heart (in 1890) insists especially upon the arrhythmia and the detection by auscultation of a peculiar "galloping sound" (*bruit de trot*), a rhythm composed of three sounds provoked by an effort of a systolic nature, between both normal sounds.

*Bradycardial Heart in Influenza.*—This syndrome was known a long time ago. Huchard and Eichhorst consider it frequent, while Sansom, on the contrary, thinks its appearance very rare. It can appear at any moment during influenza, and, when it lasts, as in a case reported by the authors, it often takes a paroxysmal form. The pulse has, on an average, 50-40 beats. Sansom has observed a case with 19, and Strauss another case with only 15. This trouble is accompanied by general asthenia and deep prostration, which last for a long time. Sometimes the condition lasts for fifteen months, but generally ends in recovery.

*Tachycardial Heart in Influenza.*—This is very rare, according to the authors' experience. It may be intermittent or constant. The pulse-rate may average from 120 to 140 beats, but Pawinski observed a case with 300 beats a minute. The attacks of tachycardia are accompanied by intense thoracic pain, respiratory distress, and stasis of the pulmonary circulation. The syndrome may last for a long while or disappear suddenly after an intense paroxysm. The prognosis is bad, the outcome is generally fatal. Sometimes the condition is complicated by signs of exophthalmic goiter.

*Arrhythmic Heart in Influenza.*—Eichhorst has called this "extra-systolic grippal heart." It may present very varied forms, from a marked arrhythmia (heart madness, "*folie du coeur*") without any subjective signs, to a "simple occasional intermittence" accompanied by marked precordial distress. The arrhythmia may be bigeminal, trigeminal, alternans or complete. This syndrome appears at the same stages as bradycardia, and sometimes terminates in recovery or tends to establish a chronic myocarditis and asystolia.

*Syncopeal Influenzal Heart and Neuralgic Influenzal Heart.*—These are symptoms also encountered during influenza, but they cannot be considered as syndromes. The former is rather frequent, and generally ends in death. The latter was first reported as far

back as 1729. It is very frequent, and American authors have reported some cases. This precordial pain is present in almost all cases of influenzal heart involvement. It may appear at any stage of the disease, and is generally benign.

The pathogenesis of the syndromes discussed above is rather obscure. Huchard tries to explain them by admitting the existence of a cardioplegia resulting from the involvement of the vagus and also of the heart bulbar centers. According to this, heart influenza is a bulbar affection; only the arrhythmia might be attributed to the invasion of the heart fiber. The same author also admits a coronary endocarditis that would, after a certain time, produce a degeneration of the myocardium. Sansom thinks that the cause is an irritative lesion of the accelerating nerve of the heart in the case of tachycardia, and that the cause of bradycardia is neuritis of the vagus. He also admits a possible thyroid hypersecretion, founding his belief upon the signs of basedowism which he has observed. He explains the pains by the presence of an affection of the ganglions of the cardiac plexus, or of a phenomenon similar to visceral neuralgia. Althaus also recognizes a lesion of the vagus and of the bulbar centers. De Batz classifies the accidents under four pathogenic forms:

(1) Accidents due to the pneumogastric nerve; palpitations and tachycardia.

(2) Accidents due to the sympathetic system; bradycardia and hypotension.

(3) Accidents due to the action of the influenza toxin upon the automotor centers of the heart; arrhythmia, intermittence, syncope.

(4) Accidents due to bulbar intoxication; bradycardia, prostration, etc.

The pains are due to a neuritis of the brachial plexus similar to toxic angina pectoris. The cause of the pains might also be an aortitis, according to Sansom.

The authors, after discussing the opinion of other writers, and the modern knowledge of physiology and pathology of the heart, conclude that the cardiac manifestations of grip are due to a massive or a slight action, according to the extension of the involvement, of the influenzal toxin upon the heart. Influenza is a general infection which invades all parts of the cardiovascular apparatus and even the internal secretion glands, and, according to the part of this ap-

paratus which is involved, the cardiac syndromes acquire a different form.

The prognosis is generally unfavorable, especially when an organic lesion of the heart exists. Sudden death is not rare. Complications are also frequent: embole, pyohemia, asystole, collapse. Age is an important factor in prognosis. An old myocardium has less resistance than a young one. A previous cardiopathic history renders the prognosis the worse.

The treatment consists in rest, ice-bags to the precordial region, digitalis, caffenin, Strophanthus and other cardiac tonics. The administration of adrenalin is always effective. Prostration and collapse are combated by the common stimulating means: alcohol, ether, strychnin, ammonium acetate. Complications call for symptomatic treatment, and the patient should be closely watched during convalescence. The administration of strychnin and arsenic during this stage may prove useful.

C. F. ARROYO.

LOBELL, A.: A Case of Scarlet Fever with Pneumonia as a Complication. *Medical Record*, Nov. 8, 1919, xevi, 763.

The rarity of pneumonia as a complication of scarlet fever prompts Lobell to report this case: The patient was a female four years of age. A typical case of scarlatina developed April 12, 1919. Her previous history is of no significance. On April 25th she developed a purulent otitis media of the left ear, which continued to discharge for five weeks. A few days later the right ear became involved; after early incision of the drum the condition soon subsided.

On April 28th the patient began to cough and complained of pain in the back of the chest. Her temperature was 104° F. (40° C.), pulse 130, respiration 36. Two days later there was definite dullness over the right lower lobe extending up to the seventh rib and laterally almost to the axilla. Vocal fremitus was absent; the voice was not transmitted; vesicular breathing was absent except in an area about the size of a silver dollar between the eighth and ninth ribs, and further toward the median line there was distinct bronchial breathing, which was almost cavernous. Over this area the percussion note was also dull.



For twelve days the temperature ranged between 100° and 105° F. (37.77° and 40.55° C.); the dullness increased almost to flatness. There was apparent displacement of the heart. Cough was very severe, at times spasmodic, and there was profuse, tenacious sputum without odor. Intense pain and tenderness were noted over the affected area. As time went on the temperature assumed a remittent character, and the little patient was drenched with perspiration. She had a hectic flush and anxious facies.

Aspiration was performed on two occasions. Once 5 c.c. of pure blood was obtained and once it was a dry tap.

The x-ray showed diminished illumination at the base of the right lung further toward the median line than in the axilla. No pulmonic markings were seen through the shadow. The costophrenic sinus was not obliterated; the dome of the diaphragm was partially obscured by the shadow. The left lung was normal.

While Lobell was considering the question of surgical interference for a possible pulmonary abscess or sacculated empyema the patient's temperature began to decrease by lysis, and, in spite of an intercurrent attack of acute nephritis, she made an uneventful recovery. There was a gradual diminution of the dullness, reappearance of the vesicular murmur, but at no time were any resolving râles audible.

The author is of the opinion that a mucous plug obstructed a main bronchial branch and caused the unusual physical signs. We had no facilities for making blood-counts or cultures of the sputum and blood.

M. KESCHNER.

JONES, W. A.: Cerebral Pressure Following Influenza. *Northwest Medicine*, Oct., 1919, xviii, 201.

The author discusses the most important neurological and mental complications of influenza. He considers the pathological condition of these complications to be due to an edema of the nerve structures. In one of his autopsies, on a severe case of influenzal encephalitis, he found: edema, congestion, and punctate hemorrhages in the brain-stem, basal ganglia and central substances. The writer, in describing the various nervous complications, such as slight and transient

aphasia, amnesia, paralyses, etc., includes encephalitis lethargica among the nervous complications of influenza. (This is not in harmony with the prevalent opinion that encephalitis lethargica is a disease *sui generis* and bears no etiological or pathological relationship to influenza.—Abstr.)

In the treatment of these complications he recommends careful nursing during the acute stage and the avoidance of severe exercise during convalescence, with the administration of iron and strychnin hypodermatically. For the severe headaches and mental symptoms (delirium), he suggests early and frequent lumbar punctures. He advises no operative procedures, except in case of an emergency, during an attack of influenza.

M. KESCHNER.

COSKINAS, G. S.: On Aseptic Pleural Effusions Following Grippe  
*La Presse médicale*, Jan. 17, 1920, xxviii, No. 5, pp. 43-46

The pulmonary lesions associated with grip are often accompanied by slight aseptic pleural effusions—serohemorrhagic, serofibrinous or puriform.

The effusion usually appears rarely in the disease, and is of short duration.

The effusion becomes purulent in about 13 per cent of the cases. Sometimes aseptic pleural effusion is associated with encysted or interlobar empyemas.

The cytology of these grippal pleural effusions show a marked variability—both in the number and the type of the cells.

S. KAHN.

SABOUTIN, C.: Menstrual Equivalents in Tuberculous Women  
(Les équivalents menstruels chez les tuberculeuses). *Paris médical*, Paris, Jan. 3, 1920, No. 1, p. 11.

In non-tuberculous women menstruation is often accompanied by numerous troubles of a congestive nature. The pathogenesis of those troubles is thoroughly established at present. Almost every physician admits that during the ten, twelve or fourteen days preceding

the monthly period an anatomophysiological evolution takes place in the ovaries, consisting in the production of great quantities of endocrine elements which pass over into the blood and hamper circulation. When fecundation is lacking the system can not use these elements, and tries to get rid of them, the menstruation being the expression of that attempt. Menstruation may be normal, or may be accompanied by congestive phenomena in any organ either near by or far from the genital apparatus.

In tuberculous women the utero-ovarian function is altered by the tuberculous toxin, and the female system shows a tendency to avoid the natural way of ridding itself of the menstrual toxins. The consequence will be congestive phenomena of various sorts in some other organ or organs, which we must consider as *locus minoris resistentie*. The disturbances of menstruation are therefore more marked in tuberculous women. Very often one or two of these congestive manifestations will take the place of the uterine hemorrhage, and in these cases they may be considered as true menstrual equivalents. The equivalents are, in the order of their frequency, as follows:

*Menstrual Hemoptysis.*—This may be of two different kinds. It may be accompanied by pulmonary congestion, with râles, and marked pain, or it may be alone, without any other manifestations on the part of the lung, *as if the blood were coming out of a faucet*. In both instances there is more or less rise in temperature. The first form is more severe than the second. Postmenstrual hemoptysis has also been observed, but this cannot be considered as a genuine menstrual equivalent.

*Menstrual Epistaxis.*—This symptom can very often be observed also, coincident with the monthly period. It fully takes the place of menstruation in many cases.

*Menstrual Hemorrhoidal Hemorrhage.*—This is most frequently observed in the case of patients suffering from constipation. It may be a total or a partial equivalent. In this case it is accompanied by the normal uterine hemorrhage or by any one of the other equivalents. As a total equivalent it is very rare.

*Menstrual Diarrhea.* Menstruation in normal women is often accompanied by intestinal relaxation. In tuberculous women this symptom is exaggerated, and in some cases fully takes the place of the uterine discharge.



*Menstrual Leukorrhea.* This symptom is very common in tuberculous women.

*Menstrual Rhinorrhea.*—This is never a total equivalent. It may be accompanied by any of the others or by the uterine hemorrhage.

*Menstrual Bronchorrhea.*—This is only a partial equivalent.

*Menstrual Sweats.*—This is only a partial equivalent and is very seldom. The author has observed only 2 cases.

*Menstrual Biliary Emesis.*—This symptom, and *menstrual congestion* of the liver, may also be observed as anomalies of menstruation in tuberculous women, but they are only partial equivalents. They may produce choluria and jaundice.

Fever and pulmonary congestion coincident with menstruation can not be considered as equivalents. They are merely the expression of partial toxic discharges, like headache, neuralgia, herpes zoster, and lumbar pains, which are also observed in normal women.

C. F. ARROYO.

GRAY, E. A.: Artificial Pneumothorax. *Illinois Medical Journal*, Jan., 1920, xxxvii, 7.

The author bases this paper upon experience gained from the study of 400 cases of artificial pneumothorax at the Chicago Fresh Air Hospital. He defines artificial pneumothorax as a condition produced by the introduction of an innocuous gas into the pleural cavity as a therapeutic measure, and characterized by partial or complete collapse of the lung.

*Indications.*—These are hemorrhage, cavity, extensive disease of one lung, persistent temperature, and failure to improve after ordinary treatment for pulmonary tuberculosis. The method has also been used with some success in the treatment of pulmonary abscess. The induction of pneumothorax is also advisable when the patient, after having made a fairly good recovery in a sanatorium, is to return to unhygienic surroundings and is not likely to continue his discipline.

*Hemorrhage* is in itself a strong indication for the production of a pneumothorax, regardless of existing disease in the other lung, unless such disease be so far advanced that the lung will not carry on the work of respiration after the collapse of the bleeding lung.

*High temperature*, being an index of an active process, may also be considered a good indication for the induction of lung collapse, if the disease be confined to one lung.

*Contra-indications*.—Bilateral pulmonary involvement, advanced cardiac disease, serious disease of any other vital organ, old pneumoconiosis, severe tuberculous laryngitis and bronchopneumonia following pulmonary hemorrhage, are unfavorable for artificial pneumothorax. Pregnancy is not a contra-indication.

Bilateral disease *per se* does not constitute a contra-indication. Often enough, where both lungs are extensively diseased, immobilization of the worst one resulted in marked improvement in the lung, which is involved to a lesser extent. In this connection it must be borne in mind that even where sufficient pulmonary tissue remains in the "good" lung to carry on respiration, there may be so much necrosis and infiltration in it that the additional work thrown upon it after collapse of the opposite lung tends to aggravate the process of destruction, although it may often happen that collapse of a diseased lung produces a blocking of the lymph- and blood-channels, with a resulting diminution in the absorption of toxins. This has sometimes resulted in great improvement and prolongation of life.

*Prerequisites*.—There must be a free pleural space, and the healthy lung must possess sufficient functioning tissue to carry on breathing. As a rule, the longer one waits, the further the disease will have progressed, and the more likely will be the occurrence of adhesions with less likelihood of a successful result following operation. Therefore, the earlier one performs a pneumothorax, the better the chances of a permanent cure.

*Apparatus*.—The necessary outfit for a successful operation consists of a gas-container holding nitrogen gas under pressure, a gasometer, a manometer, tubing and needle. Some operators employ atmospheric air. The advantage of this is the reduction of the frequency of pleural effusions, which appear in many cases after pneumothorax has been maintained for a variable period, but this advantage is offset by the necessity for more frequent insufflation, the oxygen of the air being more rapidly absorbed than nitrogen. The smaller needles (blunt 18 gauge) are much less painful than the others, so that local anesthesia may be safely dispensed with.

*Selection of Site of Operation*.—Before resorting to operation it is advisable to observe the patient for at least thirty days; this, of

course, does not apply to the emergency operation in cases of hemorrhage. Prolonged study of the case will elicit many points which may be overlooked at first. Bed rest for thirty days will perhaps reveal, in some cases, that the disease is largely limited to one lung, although both lungs may appear to be involved, while in other cases the patient's general condition will have become more serious by the end of this period, and the lung findings will show that operation would be futile.

The proper location of the proposed puncture is determined by a careful examination of the chest by inspection, palpation, percussion, auscultation and x-rays.

*Inspection.*—One should note: Litten's intercostal retraction, the position of the heart, the general thoracic mobility, whether limited generally or unilaterally, also the color of the skin and lips, cyanosis, and dyspnea.

Litten's sign—a diaphragmatic phenomenon—is not to be confused with intercostal retraction occurring during inspiration and caused by extensive pleural adhesions. A true Litten signifies a free pleura, and where a free pleura exists gas may be introduced.

Displacement of the apex beat to one side or the other indicates the side on which the older lesion and the more extensive adhesions will be found. An apex beat to the left of the midaxillary line, or well to the right, often indicates that the heart partly fills a large cavity and that cicatrization must have already occurred, and therefore that the pleural sinus has long since been obliterated. Percussion and auscultation will usually corroborate these findings.

Although marked cyanosis may be said to be a contra-indication to the operation, nevertheless there are some cases with much cyanosis which do well after lung collapse.

*Percussion.*—One should try to find a normal or almost normal percussion note in the midaxillary line or between the midaxillary and interior axillary lines. It is least likely to be found in the back. Areas with tympanitic notes are to be avoided, as are areas of dullness due to a thickened pleura. Hyperresonance, pointing to a cavity or adhesions rather than to a free pleura, is not a favorable condition for operation.

*Auscultation.*—Areas with râles audible as if they were close to the stethoscope, and with cavernous respirations, are to be avoided. Absence of respiratory murmur is indicative of absence of a free



sinus. An ideal area is one in which the râles are fewest and where there is at least some approach to good breathing, even though that area is small and in patches. A friction rub indicates a free pleura.

*Roentgen Rays.*—Inasmuch as the *x*-rays penetrate a thickened pleura with ease, a clear plate is of no value, unless it is compared with the physical signs. A free sinus will most frequently be found where the plate shows the lung to be normal. Consolidation and cavity usually indicate the presence of pleurisy, and must therefore be avoided. The value of the *x*-ray is greatest in the presence of bilateral involvement because it will show to what extent the disease exists in the “good” lung.

*Operation.*—The patient is to be examined sitting and re-examined lying upon the table. A hard cushion should be placed under the chest so that the intercostal spaces will be separated; this raises the site of puncture while the head lies unsupported on the table. This position also minimizes the chance of gas embolism.

The site of puncture having been selected, the skin is painted with tincture of iodine. A nick, not larger than the diameter of the needle to be used, is made with a bistoury. When bleeding is present one must wait until it has ceased. The needle connected with the manometer is now carefully passed into the wound and slowly pushed through the fascia, muscle, and parietal pleura; after passing the needle through the pleura it is not always possible to judge exactly how much force it is necessary to use in order not to press against or to puncture the visceral pleura, or the lung itself. A visceral puncture with the small needle is of no importance unless a tubercle be punctured, when infection of the pleura is possible. If a venous sinus is actually entered, however, embolism may result, even if the small caliber needle is used.

As soon as the needle enters the pleural sinus, the proximal branch of the manometer is seen to rise; at this time the gas is to be turned on. With the opening of the cock the negative pressure in the manometer changes to an equally sharp positive pressure. When the sharp rise in the proximal branch is jerky, it is best to withdraw the needle slightly, as this usually indicates that the needle is pressing against the lung. A steady jerky rise, however, results when the needle becomes freed from pressure by the lung.

At the initial operation no more than 50 c.c. of the gas are allowed to enter the sinus. The change of the negative into a positive pres-

sure is an indication to stop the operation, no matter how little gas has been insufflated. The operation is also to be discontinued when the patient appears distressed, or complains of undue pain or shortness of breath, or of fear.

When an established pneumothorax is punctured, the manometer registers a sharp positive; this may signify that the contained gas is under pressure. Either the gas from a previous insufflation has not been absorbed, or fluid has formed in the pleural cavity, to such an extent as to place the gas under pressure. When the patient, during an insufflation, coughs deeply, or when a spontaneous pneumothorax is punctured, the escaping air may be so great in amount as to expel the registering fluid from the manometer; the manometer should then be immediately filled to the zero mark. This can be accomplished during the operation by clamping the tube between the needle and the T, without withdrawing the needle.

(The different changes in manometric pressure are of great significance in the interpretation of the various mechanical phenomena which accompany an insufflation. Their correct interpretation and evaluation are matters requiring a knowledge of the physics of circulation and respiration coupled with proper clinical judgment and experience—Abstractor).

After the needle is finally withdrawn the small wound is sealed with collodion and cotton.

The second operation is performed in two days, the third in about three days; later the interval may be lengthened to one week, until it reaches three or four weeks.

Pain on deep breathing after an injection is probably due to the strain upon an adhesion, and quickly disappears. After the first operation, larger quantities of gas, even as much as 1,000 c.c., may be administered. In the treatment of hemorrhages the amount to be given depends on the ability of the patient to take it and on the necessity of the case.

*After-care.*—After the first treatment the patient is returned to bed and kept there for twenty-four hours. After succeeding refillings, he may remain sitting in an easy chair. At all times stooping or straining at stool are to be avoided and a severe cough is to be alleviated by means of opiates. These measures will prevent mediastinal rupture as well as an open pneumothorax.

The writer does not approve of pneumothorax treatment for office

practice unless assistants are present and a rest room is available. When the time has come to stop the insufflations the interval between them may be lengthened, and less gas may be administered at a sitting. After collapse of a year's standing the absorption of gas is slow; nevertheless it takes place. The marked dislocation of the thoracic organs may sometimes be a source of discomfort, but sooner or later readjustment takes place and the patients are relieved. Gray has seen patients who, after this treatment, have returned to wage-earning positions; some were well enough to enter military service.

Some of the untoward effects during the operation are:

(a) *Overinflation*.—This may occur even when the manometer shows a fair negative pressure, and is evidenced by dyspnea, pain, and a sensation of fullness in the chest; it is best relieved by allowing the gas to escape or by withdrawing it by means of the siphon bottle.

(b) *Emphysema*.—Emphysema may follow overinflation. It occurs very rarely when the small caliber needle is used. But when the pleura is thickened it seems that the puncture wound fails to close and the gas escapes. It may amount only to a slight crackling under the skin near the puncture or may extend up to the face and down to the hips. There is no pain beyond soreness, and no danger. The condition, as a rule, disappears in eight or ten days.

(c) *Effusions*.—An accumulation of fluid in the pleural sac after pneumothorax may occur in a large number of cases. The quantity may be so slight as to cause no inconvenience whatever, or so large as seriously to embarrass respiration. In addition to the ordinary physical signs, the fact that there is a reduction in the amount of the gas taken is of great diagnostic aid. At times the patients can hear the splash or feel the motion of the fluid in the chest. The action of the fluid on the lung is the same as of gas, namely compression. The treatment consists in the ordinary measures for pleurisy with effusion. In some cases the fluid absorbs spontaneously; in others tapping is necessary.

(d) *Gas Embolism*.—The symptoms of this accident are dizziness, blindness, a sense of bewilderment, nausea, headache, and numbness in one or more parts of the body. The condition is produced by the entrance of nitrogen into the circulation, by which it is carried to the brain. The author's experience is limited to 2 cases, neither



of which was fatal. The author attributes the severer symptoms such as convulsions, paralyses and mottling of the skin, reported by German observers, to the large needle used on the continent. The treatment consists in rest, keeping the head low, stimulants, and oxygen in cases with poor respiration. The author mentions artificial respiration only to condemn it. So-called "pleural shock" does not differ from gas embolism.

(e) *Partial Pneumothorax*.—No real result is reached by a partial collapse of the lung.

(f) *Seropneumothorax*.—Fluid *per se* is only harmful when it interferes with the respiration and circulation. Ordinarily the expectant method of treatment is the best. There is less likelihood of free absorption of toxins from the pulmonary lymphatics under compression than when pressure is removed. However, when removal of the fluid is indicated, from 500 to 1,000 c.c., or only enough to give subjective relief, is to be aspirated. Should the fluid continue to accumulate, 20 c.c. are to be withdrawn and injected subcutaneously—a form of auto-inoculation.

*Detection of the bleeding lung in pulmonary hemorrhage:*

(a) *Inspection*.—Inspection is not always to be relied upon, although lagging of one side is a good sign to consider, when it is present.

(b) *Percussion*.—When gently performed this will elicit more or less extensive dullness in the front or back.

(c) *Auscultation*.—In early stages the observer hears very little; the breath sounds are either very feeble or absent, and large bubbling râles are frequently heard in the other lung. This is probably due to the blood flooding the bleeding lung in the neighborhood of the injured vessel and to its overflowing across the bifurcation into the large bronchi of the second lung. The blood is soon expectorated, and the sounds of this "good" lung become more nearly normal. Later examination will elicit one or more areas of fine crepitation in the opposite lung, in which the breath sounds are diminished or absent.

*Needle-blocks*.—These are, as a general rule, prevented by nicking the skin prior to introducing the blunt needle. When, however, blocking does occur, it is best to withdraw the needle and to clean it

before allowing the gas to enter the cavity. (At all times observation of the manometer is a *sine qua non*.)

*Pregnancy and Pneumothorax.*—The author's experience is limited to 4 cases as a result of which he believes that pneumothorax has no unfavorable influence on pregnancy or parturition. As pregnancy progresses the amount of gas taken becomes less, until it may fall as low as 200 c.c. It is advisable to continue the pneumothorax postpartum, but the lungs and sinus must be carefully watched lest the gas absorb and collapse terminate prematurely. Most painstaking study on the part of the physician at all times and under all conditions is very essential in these cases.

M. KESCHNER.

GAMMONS, H. F.: Tissue Injury an Important Factor in the Development of Tuberculosis. *Boston Medical and Surgical Journal*, Jan. 29, 1920, clxxxii, No. 5, p. 119.

In the determination of the point of localization of tuberculous complications, tissue injuries are very important. These may be of a mechanical, physical, or chemical nature. The following 4 cases are given to prove the point:

*Case 1.*—The patient fell, injuring his knee, in 1909. The knee was swollen and sore until 1915. The knee was resected and the condition diagnosed as tuberculosis. Examination in 1917 revealed pulmonary tuberculosis, and the author believes that the history and findings show that pulmonary tuberculosis existed long before tuberculosis of the knee.

*Case 2.*—In 1911 the patient injured his knee. In 1913 the leg was amputated above the knee. A diagnosis of tuberculosis of the knee was made. In 1919 examination showed pulmonary tuberculosis. The physical signs and history convince the author that tuberculosis existed before the injury.

*Case 3.*—In 1903 the patient was kicked by a horse and the tissues in the region of the right ilium were injured. In 1910 an abscess formed, the pus of which was positive for tubercle bacilli. In 1910 the patient injured his right ankle, which continued to be sore at intervals. In 1917 the author found chronic tuberculous infec-

tion in both lungs. The ankle and right ilium were both tuberculous.

*Case 4.*—In 1918 this patient had a severe contusion of the right hand. The hand continued to be sore and swollen, and a few months later x-rays revealed a tuberculous condition of the small bones of the hand in the injured area. Physical examination showed a pulmonary tuberculous involvement of long standing.

The conclusion is that all patients with pulmonary tuberculosis should avoid all possible injuries.

M. M. BANOWITCH.

HART, W. M.: The Tuberculosis Problem Under After-war Conditions, with Reference to Canada. *Journal of State Medicine*, Nov., 1919, xxvii, No. 11, p. 336.

In pre-war conferences the impression was given that many cases of tuberculosis were wrongly diagnosed as other diseases. During a war-time conference emphasis was laid upon the frequency with which cases of other diseases were labeled tuberculosis. This brings home the necessity of being cautious in making a diagnosis.

Before the war tuberculosis workers had an idea that the essentials for complete success were unlimited authority backed by unlimited financial resources. These conditions existed in the Canadian Army, but it was discovered that another primary essential of success is the education of the general public with regard to the essential facts of the disease and the means necessary for its prevention, and the principles of its successful treatment.

The tentative conclusion is drawn, although the figures are not given, that army life in active service is more apt to develop latent tuberculosis in those under twenty than in those of greater age.

It will probably be found eventually that army life did cause the development of a latent tuberculosis in many instances. On the whole, however, the actual incidence of the disease was not increased as much as might have been expected.

The great value of special education in antituberculosis work, both for the layman, the medical student, and the general practitioner, cannot be overestimated, as is shown by the services rendered by medical officers with this special training during the war.

P. L. DuBois.



BERNARD, L. AND BARON: Cure of a Case of Pulmonary Tuberculosis by Artificial Pneumothorax (Un cas de guérison de tuberculose pulmonaire par la methode du pneumothorax artificiel). *Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, March 11, 1920, xxxvi, No. 9, pp. 308-310.

The patient, who had tuberculous cavitation of the upper lobe of the right lung, with positive sputum, was treated for a period of about two years with fortnightly production of an artificial pneumothorax. At the end of the period of treatment, there was a practically complete *functional* cure—with no cough, no expectoration, and such general improvement that the patient was able to undergo the hardships of four years' warfare. X-ray plates show pictures entirely different from those observed when the treatment was first begun, but it is difficult to say whether the changes seen are due to cicatrization or to alteration arising from the disease itself.

S. KAHN.

FISHBERG, M.: Diagnostic Pitfalls in Pulmonary Tuberculosis. *Medical Record*, Jan. 17, 1920, xcvii, p. 89.

Experience has taught Fishberg that bias has had much to do with the difficulties in the differentiation of chronic diseases of the lung. In identifying tuberculosis, as with all other diagnostic problems, the physician who approaches his patient with an open mind, and takes into consideration only actual clinical facts, carefully observed and correlated, will avoid the most common pitfalls.

Familial tuberculosis, which is quite common, is responsible for much of the prejudice in the minds of physicians in evaluating the facts gathered from the family history of the patient. Not all the progeny of tuberculous parentage develop tuberculosis. In fact, statistics have distinctly shown that a family history of tuberculosis may be obtained among non-tuberculous patients almost as frequently as among tuberculous ones.

In doubtful cases tuberculosis is not to be assumed merely because there is a history of exposure to infection. Despite the intimate contact with a tuberculous individual, conjugal tuberculosis is very rare.

Signs and symptoms of glandular, arthritic and osseous tuberculosis in a patient who is coughing should not lead to a hasty diagnosis of pulmonary tuberculosis. "If you bear in mind", says Fishberg, "that chronic pulmonary tuberculosis is exceedingly rare in persons showing scars on the neck, or deformities of joints or bones, you may avoid the trap."

Many physicians fall into a diagnostic trap when they pay undue attention to a previous history of some disease which has the reputation of being an etiological factor in tuberculosis. Among these pleurisy and influenza are perhaps the most important. It is wrong to tell every patient with pleurisy that he is surely doomed to succumb to tuberculosis in the near future. As a matter of fact when a patient develops pulmonary tuberculosis, the fact that he has had pleurisy is very much in his favor; the disease is likely to pursue an exceedingly chronic but benign course and to tend toward recovery. Contrary to the older views, the recent epidemic of influenza has demonstrated that the disease bears no etiological relationship to tuberculosis. The pulmonary sequelae of influenza are hardly ever tuberculous in nature; most of these patients suffer from bronchitis, bronchiectasis, pleurisy, abscess of the lung, etc.

Although the vast majority of patients who spit blood suffer from tuberculosis, there are many who do not. In about one-third of the cases of patients with hemoptysis who have consulted the author within the last three years, the hemoptysis was not due to tuberculosis. The most frequent cause, after tuberculosis, was mitral stenosis. Such patients often cough, lose weight, have a mild fever, expectorate blood, and give physical signs of a localized lesion in the lungs. When one finds the pulse slow, and more or less irregular, the size of the heart larger than normal, a presystolic murmur or a slapping first sound, or when the chief subjective symptoms are shortness of breath on slight exertion, palpitation, congestion of the face, edema of the ankles, etc., it is safe to attribute the hemoptysis to cardiac disease and not to tuberculosis. Tuberculosis is never to be diagnosed in the presence of mitral stenosis unless tubercle bacilli can be demonstrated in the sputum. Cardiac patients, except those suffering from pulmonary stenosis, hardly ever develop active pulmonary tuberculosis.

Pulmonary infarction is another not very uncommon cause of more or less copious bleeding, and the site of the infarction may

show dullness, feeble or bronchial breath sounds, and later moist râles, all localized over a small area of the chest. A careful examination of the cardiovascular apparatus will make the diagnosis clear in practically all cases.

Patients suffering from pulmonary emphysema and bronchitis sometimes have bloody sputum; this is especially so in patients with chronic bronchitis and bronchiectasis. In these cases, it is well to bear in mind that, in generalized bronchitis, percussion of the upper lobes of the lungs is negative, while on auscultation adventitious sounds are heard all over the chest. Chronic bronchitis is usually secondary, and its cause may be found to be cardiac disease, nephritis, pulmonary emphysema, etc. In these cases there are no evidences of toxemia, fever, tachycardia, etc., and the blood-pressure may be rather high; emaciation, which is the rule in tuberculosis, is not a feature in these conditions.

Bronchiectatic cavities are commonly found in the lower lobes of the lungs. If the resonance and breath sounds over the upper lobes are normal, and adventitious sounds absent in these localizations, no matter what signs are elicited over the lower lobes, unless tubercle bacilli are found in the sputum tuberculosis should not be assumed. Moreover, in tuberculous involvement of the lower lobes, a lesion will almost invariably be found in one of the upper lobes and the constitutional symptoms of tuberculosis will be very pronounced. With bronchiectasis, as a rule, the nutrition of the patient, and his general condition, remain good; he may be rather stout, and the pulse may be normal, a very infrequent condition in tuberculous cavities in the lower lobes. Clubbed fingers in these cases are evidence against tuberculosis.

Hemoptysis is a common and annoying symptom of congestion of the posterior nares and tonsils. In many cases a history of epistaxis with a careful examination of the rhinopharynx will make the diagnosis clear.

The text-books describe the differentiation between hemateme-sis and hemoptysis as a comparatively simple matter; in actual practice, however, the diagnosis is by no means so easy. In several cases, seen for the first time, the author has been unable to locate the source of the bleeding. He watches the patient for a day or two. If, after the large gushes of blood have stopped, he keeps on bringing up streaky sputum for several days, he decides that the blood comes



from the lungs. On the other hand, if a patient in whom the physical signs are doubtful has a large hemorrhage, which ceases suddenly, and no streaky sputum is expectorated, the source of the blood is, in all probability, in the stomach; blood may then also be found in the stools. However, it may be found in the stools of tuberculous patients who have swallowed blood during a hemorrhage from the lungs.

Faulty interpretation of physical signs in the chest has been the cause of the disruption of many families and has led many individuals to become hypochondriacs. According to Fishberg, "one who makes a fetish of physical diagnosis, and relies exclusively upon signs of slight alterations in the resonance of the chest, and modifications in the breath sounds, is liable to prove more mischievous to his patient than one who knows nothing at all of percussion and auscultation." The cause of this misunderstanding is that the physician with a narrow perspective expects that every human being he examines must have a perfect chest. "This", says the author, "is as rare as a perfect man in other regards."

The diagnosis of pulmonary tuberculosis is not to be made merely because there are slight changes in the resonance of the chest, or alternation in the breath sounds heard on auscultation, unless the patient shows constitutional symptoms of phthisis. The more widespread the râles are over the chest, the less likely they are to be tuberculous. Râles heard exclusively over a localized area in the apex of the lung are pathognomonic of tuberculosis; when they are heard exclusively over one or both lower lobes, the chances of their being tuberculous are very remote. The moist râles heard over the base of the lung are indicative of various nontuberculous processes; if found to be bilateral, they are due to primary or secondary bronchitis, although bilateral bronchiectasis may occasionally be met with. In most instances, these coarse, moist, râles are heard over only one base and are due to bronchiectasis, nonspecific pulmonary infections, especially those following influenza, unresolved pneumonia, pulmonary abscess, chronic pleurisy, gangrene of the lung, and pulmonary infarction. In these cases, there are no grounds for fear that the disease may develop into tuberculosis, as patients and, at times, some physicians think.

Chronic bronchitis is bilateral and usually secondary to pulmonary emphysema, heart, or kidney disease. Nonspecific pulmo-

nary infections are unilateral, but here we have a history of a previous influenza, or pneumonia from which the patient has not recovered. In such cases the patient continues to cough and expectorate abundant sputum free from tubercle bacilli. In this connection, the author urges the necessity of remembering that tuberculosis very rarely follows influenza or pneumonia. Moreover, despite the annoying cough and abundant expectoration, few if any of the constitutional symptoms are found which are characteristic of advanced tuberculosis of the lower lobes. The temperature may be normal, except now and then when the bronchus communicating with the bronchiectatic cavity becomes obstructed; the pulse remains normal, and in spite of the cough and profuse expectoration, the patient may gain in weight.

In nonspecific infections of the upper lobe, the diagnosis is much more difficult; here only repeated examinations of the sputum will be decisive.

Pulmonary abscess is very frequently mistaken for tuberculosis. In pulmonary abscess we find a previous history of pneumonia, influenza, appendicitis, hepatic abscess, etc., of a surgical operation under profound anesthesia, especially tonsillectomy, or of operations on the jaw in the case of diabetic individuals. The sputum is fetid and free from tubercle bacilli. An extremely foul and nauseating odor of the sputum, with acuteness of symptoms, is an indication of gangrene of the lung. The sudden onset of pain in the chest, bloody sputum, and a history and signs of cardiac or vascular disease, especially of phlebitis, will be sufficient to prevent pulmonary infarction from being confused diagnostically with tuberculosis.

Fishberg decries the modern tendency of physicians to rely on roentgenography almost to the exclusion of all other methods in the diagnosis of pulmonary tuberculosis. Roentgenography has proved indispensable to the author in determining the exact lesions in many of the advanced cases of tuberculosis, but in the diagnosis of early lesions, and in the differentiation between active and quiescent tuberculosis, it is only rarely of value. Roentgenographic shadows indicate airless pulmonary tissue or parenchyma which has become fibrous or calcified, but airless tissue in the lungs is not always due to tuberculosis; any change in the lung; pleura, hilus glands, and even in the osseous portion of the thorax, of early or recent origin,

will reveal itself on a good roentgenogram. Such changes may be due to old and healed pathological processes, but their shadows are more marked the older the lesion is and the more fibrous or calcified it is. A roentgenogram, alone, without the proper evaluation of physical signs and constitutional symptoms, and without a history of the progress or course of the disease, is of no value as a positive diagnostic aid. In fact, Fishberg allows many of his patients with undisputed signs of tuberculous cavities in the lungs, evident both on physical examination and by roentgenography, to continue their occupations, if these are not of the hazardous type, as long as there are no constitutional evidences of tuberculosis.

The most important and most nefarious of pitfalls in the diagnosis of tuberculosis is the determination of the activity of the disease. The patient calls on his physician for an opinion as to whether he is sick, not as to whether he has been infected with tubercle bacilli. Infection could be demonstrated by any one merely by the application of a drop of tuberculin to the skin in the proper manner; it would be found that nearly every one would react. There is no need for any special training to qualify for this task, any physician can carry out this simple procedure.

In youthful patients who cough and show a fine tremor, dermography, flushed face, perspiration and coldness of the hands, a diagnosis of tuberculosis is frequently made because the patient, in addition to this symptom-complex, is usually underweight and easily fatigued. "Hyperthyroidism", says the author, "should always be thought of before banishing such a patient to Colorado, where he may do very badly."

Pulmonary tuberculosis in children of school age is a disease which is more often described in text-books and medical journals, and the diagnosis of which is made by medical men more frequently than it really exists. Tuberculous tracheobronchial glands, on the other hand, are very frequent. Tuberculous glands in the chest are of no more significance than are enlarged glands on the necks of children, tuberculous or others. They are troublesome but not deadly. They nearly all recover while continuing their school work. Additional nourishment, a sojourn in the country for a few months, iodids, calcium, cod liver oil, etc., may be prescribed, but by no means are the parents to be terrorized by impressing upon them the great danger to which these children are exposed. This danger is not



so great, at least in Fishberg's experience, which, it must be admitted, is very extensive.

M. KESCHNER.

DUBOFF, W. S.: Tuberculous Empyema. *The American Review of Tuberculosis*, Dec., 1919, iii, No. 10, p. 590.

These observations are based upon clinical study of 20 cases of tuberculous empyema seen at the Sanatorium of The Jewish Relief Society. Tuberculous empyema is a purulent effusion into the pleural cavity caused by the tubercle bacilli, in which the bacillus of Koch is the sole or predominating organism. It differs from the ordinary post-pneumonic empyema in the underlying, persistent, pulmonary tuberculosis which is nearly always present and obvious. Clinically the process is an extension to the pleura from the lung itself, usually by rupture. The process is so gradual, or the rupture so small, that there may be no evidence of communication and no signs of coincident pneumothorax. The rule is that these signs are not wanting. The picture is that of spontaneous pneumothorax-shock with pain, dyspnea and fever, followed by the effusion. The exudate is at first serous, rapidly becoming seropurulent. Chest aspiration during the serous stage usually yields a clear straw-colored fluid and no organisms. Cultures and guinea pig inoculations are negative. In the seropurulent and purulent stages the fluid is turbid and, as a rule, contains the organisms (tubercle bacilli). Since the pus is nearly always a sequence of lung rupture, conditions predisposing to lung rupture predispose to empyema. The most potent of these is induced pneumothorax.

*Symptoms and Course.*—The onset is sudden and generally referable to the rupture. Severe stabbing pains are noted on one side, marked dyspnea and sharp rise in temperature. When effusion develops the symptoms improve. Again, the onset may be so gradual that it is impossible to elicit a definite history. With large accumulations of pus, there may be no fever for months. The thickened pleura acts as an effective barrier against absorption toxemia.

*Diagnosis.*—The history, x-ray and physical findings can only indicate the presence of fluid. The diagnosis rests upon aspiration and microscopic examination of the exudate. For x-ray examination,

it is essential that a vertical chest plate be taken. A level layer of fluid, with a history of spontaneous pneumothorax, suggests that the fluid is pus or will become pus. A dense shadow from base to apex probably indicates the presence of an effusion if the mediastinum is displaced to the opposite side. There is a characteristic triangular shadow with the base in the median line, and a rounded apex projecting to the normal side.

*Prognosis.*—The outlook is bad. The duration of life varies from a few months to a few years, depending upon the amount of lung involvement and its complications.

*Treatment.*—Provided there are no pressure symptoms the patients were most comfortable and most free from toxemia when left alone. Indications for aspiration are dyspnea, pain, and an irritable cough. Whether air should be injected after aspiration depends upon whether it is desired that the lung should re-expand or remain collapsed. Aspiration should be done with as fine a needle as is possible to obtain pus. Enough should be withdrawn to make it worth while—not less than 500 c.c.

C. SCHMID.

BURRELL, L. S. T.: Predisposing Causes of Pulmonary Tuberculosis. *The Journal of State Medicine*, Dec., 1919, xxvii, No. 12, p. 353.

Most people have pulmonary tuberculosis. Heredity probably plays some part. Just as certain races are more liable to it, so certain families are predisposed. With the exception of influenza, no one disease predisposes to tuberculosis more than another.

Delicate people do not seem to be more liable to infection than others. The majority of tuberculosis patients are by no means below the standard physically. Individuals become delicate because they have tuberculosis; they do not become tuberculous because they are delicate.

Alcohol and syphilis are of no importance as predisposing causes. When a man spends money on drink he may not have enough left to support his family, so that they may be over-crowded and insufficiently fed and clothed. Not the alcohol, but the poverty, is to blame. In studying statistics one always finds a constant re-

lationship between over-crowding and consumption. Over-crowding is an index to poverty. The actual over-crowding may not be as important a predisposing factor as is the lack of good or even sufficient food, the misery, and the absence of hope that goes with it.

The reason why it is commoner among town poor than country poor is that there is less real poverty in the country.

Food is probably the most important factor in tuberculosis arising from poverty, and a close second consists in the larger doses of infection due to the fact that several persons live crowded together in small, badly ventilated rooms.

During the war the incidence of tuberculosis increased, whereas before it had been decreasing for fifty years. This could not have been due to the food, for most poor people lived better during the war than they had ever lived before in their lives.

Another result of poverty is unavoidable exposure to cold and wet, due to the lack of clothing sufficient for warmth and of dry clothing to put on when wet. Another disadvantage is lack of fresh air and sunshine in the rooms of the poor. It is not possible for poor people living in one room to keep their windows open in winter.

All dusty occupations favor the development of this disease, e. g., stone masons, grinders, pottery workers, file cutters, etc., are especially disposed. Coal miners, for some unknown reason, are less liable to the disease.

Jews are particularly free from this infection. The races most affected are those which have most recently come in contact with civilization, e.g., the negroes and North American Indians.

Of all the causes the most important are those consequent to poverty.

P. L. DuBois.

JOACHIMOGLU, G.: Morphin Poisoning. *Deutsche medizinische Wochenschrift*, Dec. 18, 1919, xlv, No. 51, p. 1413.

The author warns that the failure of respiration and cardiac action, and the disappearance of the reflexes, in cases of acute morphin poisoning (this also applies to other drugs of this group), do not absolutely indicate that death has occurred. In such cases, it



is possible to bring about favorable results by means of continuous stimulation of the respiratory center with stimuli applied to the skin, and with large doses of atropin. These measures must be conscientiously employed and continued for a long time, before the physician has a right to assume that the patient is dead.

M. KESCHNER.

FENTON, R. A.: Use of Dionin in Wood Alcohol Blindness. A Clinical Note. *Northwest Medicine*, Jan., 1920, xix, 22.

Fenton reports the case of a young man, who obtained 4 ounces of what he believed to be grain alcohol from a stockbottle in a drug store, pouring it out himself. He took all of this quantity, mixed with ginger ale, during the afternoon and evening of New Year's day. When he awoke the next day, his vision was reduced so that he could see only large objects; he also had polyuria and other symptoms of wood alcohol poisoning. He took freely saline purges, diuretics and much fruit juice.

Four days later his pupils were dilated and reacted neither to light nor to accommodation; his vision was 2/200. There was loss of perception for red and green while in each eye there was a large central blind spot. He had pain behind both eyes. The retinae were swollen above, below, and toward the macula from the optic disc.

A 5 per cent dionin solution was instilled into each eye. This was followed by the usual smarting and swelling of the conjunctive. Within one hour the pain of which the patient had previously complained was diminished. He was advised to use bicarbonate of soda freely by mouth, and ordered to use dionin daily for three days.

On his return his vision in the right eye was 20/20, and 20/15 in the left eye. He reported that in the morning following the first instillation of dionin, he could see objects fairly clearly, but tinged with red; in an hour's time they had turned green, and by afternoon the colors had become normal. Examination of the contents of the bottle from which he took the alcohol showed them to consist of 90 per cent ethyl alcohol, 10 per cent methyl alcohol and perhaps  $1\frac{1}{2}$  grain of bichlorid of mercury to the ounce. He is continuing the use of the dionin three days in each week. The author believes that some post-neuritic atrophy may follow, and again reduce his eye-

sight somewhat, because the edema of the retina, although much diminished, is still present. He advises the prompt use of dionin in a 5 per cent solution as a local lymphagogue in other cases of wood alcohol poisoning, even if it is not immediately possible for an oculist to examine the eyes.

M. KESCHNER.

HUBBARD, S. D.: Wood Alcohol Poisoning. *New York Medical Journal*, Jan. 3, 1920, cxi, 16.

There have been a large number of cases of death and blindness resulting from the ingestion of wood alcohol, since prohibition has come into effect. Hubbard, a medical officer in the Municipal Health Department in New York City, accordingly writes this article to warn the medical profession, the governmental authorities, and the public, of the grave danger that accompanies the promiscuous drinking of brews made by persons not familiar with compounding beverages. He cautions those inclined to seek information as to home-made alcoholic preparations not to purchase alcohol from paint stores and the like. He also emphasizes the fact that such trade names as "columbian spirits," "cologne spirits," "colonial spirits," "standard wood spirits," "union spirits," "eagle spirits," "green wood spirits," "Hastings spirits," "boom," "acetone alcohol," "purified alcohol," and others are only other names for methyl alcohol or wood alcohol.

In describing the symptoms of wood alcohol poisoning, the author states that in general they are similar to those observed in poisoning with grain alcohol and other alcohols of this series. He divides the acute form of wood alcohol poisoning into three degrees:

(1) An ordinary mild intoxication, with dizziness, nausea, and mild gastro-intestinal disturbances, terminating in recovery within a few days, but occasionally followed by more or less serious damage to the eyesight.

(2) A more pronounced form, with marked dizziness, pronounced and persistent nausea, vomiting and more or less severe gastro-enteritis, and dimness of vision, which may lead to blindness.

(3) An overwhelming prostration which terminates in coma and death.

These clinical types depend upon the quantity consumed and the resisting power of the individual. Generally speaking, the symptoms are those of ordinary alcoholic intoxication followed by disturbances of visions. The more intense the ill-effects, the more marked the clinical symptoms and the dimness of vision. This often progresses rapidly to complete loss of eyesight. More severe poisoning is accompanied by an exaggeration of the clinical symptoms, and, in addition, the patient may become blind, or nearly so, with widely dilated pupils which react neither to light nor to accommodation. The pulse is weak and the breathing slow. At this time delirium sets in, followed by unconsciousness which passes into coma and finally terminates in death. After a patient has reached the state of coma, it is very unusual for him to recover; he invariably dies while unconscious, or, having regained consciousness, he suffers a relapse and dies shortly thereafter.

In most of the severe cases which do not terminate fatally, the patients become blind, within a period varying from a few hours to several days. There may be a temporary partial restoration of vision, which in a few days or weeks gives rise to more or less complete and permanent blindness with atrophy of the optic nerve.

Hubbard cites Reid Hunt of Harvard University, who observed several cases of subacute poisoning, in which death or blindness resulted from a prolonged "spreed", and repeated doses of wood alcohol given to dogs caused, in addition to the stupor, a fibrinopurulent conjunctivitis with haziness of the cornea. The animals behaved as if they could not see; death did not occur until the ninth day.

The long-continued effects of wood alcohol, and the ease with which even small doses produce chronic poisoning, depend upon the slowness with which the poison and its products of oxidation are eliminated from the system. It has been definitely determined that the reason why the toxicity of wood alcohol is so much greater than that of grain alcohol, is that the former is but partially oxidized in the system and its continued administration leads to the formation within the body of formic acid, which is highly poisonous. The toxicity of the crude commercial preparations of wood alcohol is further heightened by the presence of certain impurities in considerable quantities in these preparations.

The diagnosis of wood alcohol poisoning in a case of alcoholic indulgence, followed by severe gastro-intestinal symptoms, and later by



partial or complete blindness with wide dilatation of the pupils, according to Hubbard, is comparatively easy, especially if the physician bears in mind that this clinical picture is unlike that of any other form of poisoning. It can be easily distinguished from tobacco or quinin poisoning if one is careful to obtain a good history. Quinin amaurosis is usually accompanied by deafness, ringing in the ears, intense anemia of the fundus oculi, and almost total obliteration of the blood-vessels of the retina.

The treatment of these cases is entirely symptomatic. There is no known antidote. If the patient is seen early, the poison is to be eliminated from the gastro-intestinal tract by inducing vomiting, syphonage, catharsis, etc., as rapidly as possible, in order to prevent absorption. The stomach is to be soothed with oily emulsions. In order to overcome collapse and maintain the patient's vitality, Hubbard sees no objection to the use of grain alcohol. (Strychnin, camphor, ammonia, digitalis, etc., would, in the opinion of the abstractor, be much better and safer drugs for this purpose. There is no satisfactory treatment for the optic atrophy.—Abstr.)

M. KESCHNER.

SIOLI, F.: On the Treatment of Progressive Paralysis with Silver Salvarsan and Sulphoxylate. *Deutsche medizinische Wochenschrift*, Feb. 19, 1920, xlv, No. 8, p. 205.

Sioli concludes that silver salvarsan and sulphoxylate are effective and agreeable measures in the treatment of this condition; they are more advantageous than the other salvarsan preparations because of the greater convenience of their administration. Furthermore, it has been established that when these agents are used, in paresis, the improvement is more extensive and more permanent than that following the use of the older measures. These periods of improvement are not such as one commonly meets in the course of this disease. They cannot be expected in cases of long standing, and in order to bring them about the treatment must be energetic and of long duration. As to the duration of the cure, nothing definite can as yet be said.

All present indications seem to point to the absolute necessity of energetic and prolonged treatment, especially in the early stages of

paresis. The exact limitations of intravenous therapy in paresis will be determined only after careful and painstaking procedures in this direction. All methods of therapy may have to be tried until definite results can be exactly obtained. Therapeutic attempts are made with the usual specific treatment, which consists in the introduction of antiluetic remedies intraspinally (Swift-Ellis, Gennerich), or into the carotids (Knauer), or into the cranial cavity; or the usual non-specific measures, such as the production of fever, are used. In more recent times attempts have been made, in cases of paresis, to induce the formation of specific antibodies by the introduction into the body of luetic products, which act as irritants. It seems that syphilitics who develop paresis do so because they are deficient in the ability to produce specific luetic antibodies, and this fact formed the basis of the method.

All these attempts, however, must be based on experience derived from the use of antiluetic measures employed intravenously. The exact limitations of these methods of treatment are still unknown.

M. KESCHER.

HOFFMANN, E.: The Protective Function of the Skin (Esophylaxis) with Some Observations as to the Origin of Paresis. *Deutsche medizinische Wochenschrift*, Nov. 6, 1919, xlv, No. 45, p. 1233.

Hoffmann concurs in the opinion expressed by Bloch during a course of lectures delivered by him at the University of Zurich, in which he stated that the skin fulfils an important biological function which has not as yet been recognized. It is by means of this function that the internal organs are protected from invasion by pathogenic microorganisms. The frequency with which one sees extensive syphilitic or tuberculous skin lesions without involvement of the internal organs, the rôle which the skin plays in overcoming some of the exanthematous infections, and in the phenomena of allergic immunity, as well as the general favorable therapeutic effects obtained after exposure to light, are to him of great significance. These facts lead Hoffmann to believe that the skin must produce immunizing materials which exert a curative influence.

This assumption is supported by the general experience that dur-

ing the extensive involvement of the skin in tertiary syphilis and lupus vulgaris the internal organs remain unaffected. This is especially illustrated by the well-known fact that the coincidence of paresis and tabes with tertiary syphilids is extremely rare, and in countries in which the latter are very common—so to speak, endemic—metasyphilitic diseases are almost never met with. Even in malignant or galloping syphilis, which shows in its earliest stages most extensive ulcerative skin lesions, the internal organs and nervous system remain remarkably free from the disease. This, Hoffmann thinks, can hardly be considered to be a mere coincidence. This antagonistic relationship between the skin and nervous system can be more readily explained by assuming that during the localization and course of the “later” syphilitic and tuberculous processes in the skin, special immunizing substances, profuse in quantity, are created, which reach the organism and there exert protective and curative influences.

This hypothesis, the author thinks, is sufficiently attractive to encourage others to further research in this direction.

M. KESCHNER.

BÖHME, A.: Disease of the Bones as a Result of Malnutrition. *Deutsche medizinische Wochenschrift*, Oct. 16, 1919, xlv, No. 42, p. 1160.

The author remarks that since the beginning of this year (1919) numerous reports have come from Austria, especially from Vienna, of the frequent occurrence of diseases of the bones, apparently due to malnutrition. The cases were characterized by pains in the bones, abnormal bending, curvatures and fractures; these were proven roentgenologically to be due to calcium deficiency in the bones. In the young the picture was that of tardy rickets, while in adolescents it corresponded to osteomalacia.

In Germany, as far as the author's knowledge goes, such reports came only from Göttingen and Tübingen. But in the districts near Bochum osseous disturbances have not been rare. The author has seen 30 cases in the hospital during the last few months, and has heard from a number of colleagues that they have seen several hundred of them during the last year (1918).

Böhme divides the cases in Bochum into two groups: The first



group comprises 20 cases and includes adults between the ages of fifteen and twenty years. They were invariably young men who were engaged in the laborious occupations of mining or iron-work. In all of them the general musculature was poorly developed, and they were all badly nourished; they were short in stature and infantile in appearance. The hairy distribution (secondary) was frequently absent.

Subjectively the symptoms were remarkably uniform. The patients all complained that for the last year or more they had been noticing pains in the legs, especially in the knees and feet, while walking or standing, whereas during rest the pains seemed to disappear entirely. Many of them complained of pains in the small of the back and in the vertebral column. Almost all of them stated that the bone pains were most marked when the patient went downstairs; the first steps in the morning after arising seemed particularly difficult. As time went on, walking became almost impossible. In many cases curvatures of the bones made their appearances within the last few months. Almost all of the patients stated that their nourishment was not sufficient in quantity, and was especially poor in fats.

On examination the joints appeared to be freely movable. In mild cases there was no tenderness on pressure of the joints, except on deep pressure on the bones (epiphyses) within the joint. In some cases there was moderate tenderness in the epiphyses as well as in the diaphyses of the long bones. This tenderness could be made out in the pelvic bones, portions of the vertebral column, sternum and ribs. In more than one-half of the cases there was more or less curvature of the bones, flat feet, genua valga or vara, in rare cases scolioses with partial secondary deformities of the chest. The tracheal cartilages were remarkably soft; this softness was also observed in the ribs. Some cases were entirely free from deformities. The gait was most tiresome and in many cases curiously waddling in character. The epiphyses of the forearms and legs were quite frequently swollen; the same may be said of the frontal and temporal bones.

In most of the cases the *x*-ray picture was most characteristic. The shadow of the bones was, on the whole, less intense, and the cortex and spongy portions rather delicate. Most remarkable were the changes in the neighborhood of the epiphyseal lines; ossification

was delayed. While in a normal seventeen-year-old individual the epiphyses have already been united to the shaft of the bone, at most only a small crack remaining between the two, in this condition the crack is wide, giving a thickened aspect at the point of union between the epiphysis and the diaphysis. These thickenings show irregular layers of deposits of lime, each layer corresponding probably to a remission of the disease. These changes are most noticeable in the flat bones, particularly in the distal parts of the forearms, although these are almost always free from subjective symptoms.

The *x-ray* picture corresponds closely to that seen in rickets. Rickets of infants as well as of adolescents (*rachitis tarda*) shows the same changes, and, inasmuch as the clinical picture throughout the course of rickets corresponds closely to that of the disease under discussion, one is justified in considering the latter to be a form of *rachitis tarda*. In all probability pathological studies, when carried out, will demonstrate the similarity of the two conditions.

It is true that in about one-third of the cases observed here and in Vienna, no *x-ray* changes could be demonstrated. The author, however, believes that in spite of the negative *x-ray* findings one is justified in including these cases also among the osteopathies due to malnutrition. He is of the opinion that these are perhaps incipient cases in which the changes are not sufficiently extensive to cast *x-ray* shadows.

Naturally when this form of osteopathy develops in older individuals in whom the union between the epiphysis and diaphysis has already been perfected, no epiphyseal "crack" can be demonstrated by the *x-ray*.

There are some cases in which the *x-ray* findings are those of transitional states of osteomalacia of adults.

Within the last few months the author has seen 7 cases of this disease, in 3 of which the disease affected women in the postclimacteric age; the remaining 6 had more or less pain in the legs on standing and walking, the pains being most severe in the hips and spine. The iliac crests, the regions of the hips and lumbar spine, were tender on pressure; the knee and ankle-joints were comparatively free from tenderness. Palpable changes in the bones, curvatures of the bones, tenderness over the sternum and ribs, were not found in these milder cases, nor was any spasm of the adductors in evidence. Roentgenological examination revealed nothing abnormal, except slight

deficiency of lime in the bones. The gait was "waddling" in all cases, and, on account of the pains in the pelvis, very difficult; in fact the patients were confined to bed for considerable periods. Bence-Jones albumin was negative. While in most of these cases the symptoms of osteomalacia were rather mild, one woman of sixty-nine years presented typical symptoms, clinically and roentgenologically, of a severe form of this disease.

Some of the women so afflicted were poorly nourished; some of them, however, appeared to be quite well nourished. In all of the cases belonging to both groups the pathognomonic feature was lime deficiency of the bones; the author has no doubt that even in the well-nourished case the deficiency was a qualitative rather than a quantitative one. The author explains these differences in the clinical varieties of the osteopathic form of malnutrition by the difference in age and sex. In the young the disease localizes itself in parts in which osseous growth is greatest, especially in the neighborhood of the epiphyseal lines, regions where rachitis, during peace time, both in the young and in adolescents, produces the most noticeable pathological changes. The greater demand upon the nutritive processes in working, growing adolescents was, in these cases, out of proportion to the quantity and quality of nourishment ingested. Böhme believes that these defects in nutrition were most evident in the bones, owing to the fact that the subjects performed most of their work standing, and that the greatest strain, in their laborious occupation, was put upon the osseous system.

Similar defects of nutrition in adults do not produce such apparent changes in the region of the epiphyses because at this age the latter have become completely ossified. The author attributes the appearance and severity of symptoms in women in the pelvic bones and spinal column to the peculiarity of structure of the skeletal system in the female. As a matter of fact, in osteomalacia during peace time, i. e., osteomalacia due to endocrine disturbance, these parts of the skeletal system of women seem to be most commonly involved, as in the cases under consideration.

The close resemblance of the clinical picture of osteomalacia of adolescents to that of ordinary rachitis, gives the clue to the proper treatment of the former: sufficiency and variety of nourishment, the avoidance of overwork on the part of the osseous system, and preparations of phosphorus and cod liver oil. With this therapy, there



is a noticeable improvement in the general condition of the patients, with a rapid diminution of the pain and a return of the ability to stand and walk properly without pain. Unfortunately the roentgenological changes are the last to show improvement. The deformities must be corrected by proper orthopedic measures. Böhme noticed gratifying results after four weeks of treatment in severe cases which had been incapacitated for six months. The therapeutic results also indicate, in the author's opinion, the close relationship between the two groups of adolescent and adult osteomalacia, and between both of these and rickets.

The author concludes his paper by expressing his regrets that hitherto it has not been ascertained which errors in diet—whether the lack of organic or of inorganic material—produce these changes in the bones. In fact, it has not even been determined whether the nutritional deficiency has a direct effect upon the bone substance itself or whether it acts injuriously upon the bones indirectly through the glands of internal secretion. The fact that in many of the author's cases the glands of internal secretion seemed to have been involved, as evidenced by the frequent regression of the secondary sex characters, seems in his opinion to indicate that these glands play at least a rôle of some importance in the pathogenesis of the disease.

M. KESCHNER.

GLASERFELD, B.: Relapsing Fever and Salvarsan. *Deutsche medizinische Wochenschrift*, Nov. 20, 1919, xlv, No. 47, p. 1296.

From his experience with relapsing fever, during the war, Glaserfeld reaches the following conclusions:

(1) We have in salvarsan a medicinal agent which is, in relapsing fever, almost invariably an effective "therapia sterilisans magna", provided its dosage is properly regulated and it is not employed in cases in which it is contra-indicated.

(2) Neosalvarsan, 0.6, administered in the first stage or in the first half of the second stage, will cut short the attack and cure the disease. The same dose administered in the interval shortens the next attack, without, however, preventing its onset.

(3) After the third day of the second attack the same good results can be obtained with 0.3 neosalvarsan as with 0.6.

(4) The administration of salvarsan is followed by an extraordinary shortening of the period of convalescence and a rapid disappearance of the anemia.

(5) The contra-indications to its use are: (a) cardiac decompensation, (b) disease of the kidneys with manifest disturbance of their function, (c) unusually severe manifestations of the disease (relapsing fever), especially jaundice, in individuals whose general condition is very poor.

M. KESCHNER

VAQUEZ, H., AND DOUZELOT: Dextrocardia and Dextroversion. *La Presse médicale*, Jan. 17, 1920, xxviii, No. 5, pp. 41-42.

Two cases are reported with x-ray and electrocardiographic findings.

Dextrocardias are congenital or acquired. Acquired dextrocardia—dextroversion—is due to some mechanical cause, usually an inflammation of the serous membranes, with resultant fibrous adhesions. Depending upon the points of attachment of these fibrous bands, there may or may not be a certain amount of torsion of the heart's axis. In either case, the cavities of the heart bear normal relations to each other. Experience proves that in all dextroversions, the electrocardiogram is always normal, especially in lead I.

Congenital dextrocardias are of two kinds:

(1) The dextrocardia occurring in situs inversus. In this condition the relationship between the heart cavities and the aorta is altered. The right heart is on the left, the left heart on the right and the aorta descends on the right of the vertebral column. Characteristic electrocardiograms are obtained in lead I. The waves are inverted, giving the appearance observed when the normal waves are held up to a mirror.

(2) Pure dextrocardias—the other organs being normal. These are of two types:

(a) Those resulting from maldevelopment.

(b) Those due to mechanical action in gestation.

Wherever there is an inversion of the heart cavities, the "mirror" appearance of the electrocardiograph will be present.

S. KAHN

## SECTION ON LABORATORY AND RESEARCH

MOESE, P. F., AND CRUMP, E. S.: Preformed Ammonia in the Spinal Fluid. *The Journal of Laboratory and Clinical Medicine*, Dec., 1919, v, No. 3, p. 185.

A simple method of determining the amount of ammonia in the spinal fluid is given as follows: To 2 c.c. of spinal fluid an equal amount of Nessler's reagent is added. In normal persons and in conditions not tending to acidosis or nitrogen retention, scarcely any brown color develops. A cloudy, greenish-gray precipitate gradually forms and the fluid turns a dirty pale green. When there is acidosis or nitrogen retention, from any cause, a deep brown color develops immediately, the depth of color depending upon the amount of ammonia present in the spinal fluid. One precaution is necessary. The fluid must be free from contaminating bacteria, as these form ammonia and give false readings. Sterile spinal fluid, well corked, will give good reactions, even when several days old. The reaction should be read immediately (within thirty seconds). In general, cases of acidosis associated with infection, and terminal stages of meningitis, develop less color than cases of uremia with nitrogen retention.

Owing to the difficulty in obtaining a permanent standard the authors consider that for practical clinical purposes standards are not necessary, and an estimate is made upon the depth of the color, the readings ranging from negative to 4 plus.

This test can be done easily and quickly, and an estimate of the blood-nitrogen retention can be made, as the nitrogen retention in the spinal fluid and in the blood usually run parallel. It is very valuable for the purpose of quickly determining the cause of coma.

C. M. ANDERSON.



PETROFF, S. A.: Serological Studies of Tuberculosis. Second Contribution: Further Observations on Complement-fixation. *American Journal of Tuberculosis*, Jan., 1920, iii, No. 11, p. 683.

Attempts to apply the complement-fixation test in the diagnosis of clinical tuberculosis have been made ever since the introduction of the Bordet-Gengou phenomenon.

*Complement.*—There are two schools, that of Ehrlich, and that of Bordet. The former believes that there are two complements, one having a strong affinity for the hemolytic system, and less affinity for the bacteriolytic system, and the second having a strong affinity for the bacteriolytic system and less affinity for the hemolytic system. Bordet's view is that there is only one complement (alexin) present in the system. A minimal double unit has so far proved the best procedure in the author's practice. A complement with a weak titer must be discarded. It has been found that the maximum titer of 0.15 c.c. of a 10 per cent complement is the limit of a single unit, and the test 0.3 c.c. of the same complement must be used.

*Patient's Serum.*—The patient's serum, when collected a day or two before the test is done, has been proven to give the best results. The author does not agree with Von Wedel's statement that sera give better results when kept in refrigerators for from four to six days.

*Salt Solution.*—After a series of experiments the author came to the conclusion that an 0.85 per cent salt solution with a 7 or 7.5 pH concentration was most suitable for the test.

*Antigens (groups):*

- (1) Tubercle bacilli, dead or living, intact or pulverized. They contain large amounts of lipins: heating does not alter them.
- (2) Filtrates of broth cultures of tubercle bacilli. These contain lipins and proteins in combination, and heat does not alter them.
- (3) Ether-alcohol extracts, as Corper's, Massol's and Calmette's. All are either extracts or derivatives of tubercle bacilli and are antigens supposedly free of lipins.
- (4) Group of minor importance, embracing extracts of various tuberculous organs.

The preparation of substances corresponding to lecithin, kephalin, cuorin, sphingomyelin, and protein antigens, is explained exhaustively.

Lipins gave no reaction. The mixture of lipoproteins appeared to give weak reactions and the protein fractions gave the best results.

*Primary Incubation Time.*—The primary incubation period of the antigen-antibody-complement is of the utmost importance, and Lewis has pointed out that one hour is not sufficient for a complete reaction complex to take place, but that from two to four hours are required. The author feels that two hours is the best time. After the hemolytic system has been added, controlling the natural anti-sheep amboceptor, the tubes are returned to the water bath and left there until the controls are completely hemolyzed. They are then placed in the refrigerator and twenty-four hours later a reading is taken. One plus and 2 plus reactions are regarded as negative; only 3 plus and 4 plus are regarded as positive tests.

*Nature of Antibodies.*—All indications thus far show that antibodies are not lipins, but are either proteins or substances carried with proteins. They are carried down with the globulin fraction of the serum when precipitated.

*Mechanism of the Reaction.*—It has been suggested that the reaction is a physicochemical phenomenon, and that the antigen-antibody-complement union is an elaborate colloidal system. Absorption plays a very important part in the reaction. It is supposed that when a sensitizer is brought in contact with its homologous antigen a colloidal complex is formed. This complex absorbs the complement. The existence of such a complex is indisputable, inasmuch as neither antigen nor sensitizer alone, when used separately in the quantity employed in the test, does absorb the complement. The complex is governed by the concentration, the external and internal phases of colloidal solution, and the temperature. The quantity of the antibodies present in a serum which can form a complex with the antigen depends upon their concentration. The greater the concentration of the antibody the stronger is the complex with antigen. The temperature is important. Antigen and antibodies being colloids, and corresponding to many hydrophilic colloids in their behavior to heat sensitiveness, above a definite temperature point between 35° and 40° C. (95° and 104° F.). At these ranges complete

complex takes place. If we take a definite amount of patient's serum with a definite amount of antigen and incubate, starting at 8° C. (46.4° F.) up to 56° C. (132.8° F.) and add complement as we approach 35° or 40° C. the reaction becomes stronger until the optimum temperature of from 35° to 40° C. is reached. If continued beyond this point the strength of the reaction decreases.

Positive complement-fixation has been obtained experimentally only in the case of a tuberculous lesion, or in tuberculosis itself. A positive reaction does not indicate pulmonary tuberculosis alone. Any tuberculous focus produced by tubercle bacilli, or by a product of tubercle bacilli, will give us antibodies. Antibodies may be of high or low concentration and a positive reaction is the result. What does a negative reaction signify? It indicates the absence of antibodies, complement-fixing, or lack of antibodies with excess of antigen or of some other substances acting as antisensitizers, or of some substance having an inhibitory influence.

C. A. SCHMID.

KOLMER, J. A.: The Nature of Thermolabile Hemolysins. *The Journal of Immunology*. Nov., 1919, iv, No. 6, p. 401.

Natural hemolysins in human sera are more resistant to heat and age than is complement. There is no relation between the complement content and the natural hemolysins in human sera. Absorption of active human sera by the corpuscles removes hemolysin but not complement. Washed sensitized cells have not absorbed complement and do not undergo hemolysis unless complement is furnished. Filtration may remove complement from a serum without any or with only slight removal of natural hemolysin. Heating serum sera at 56° C. (132.8° F.), for thirty minutes, results in the partial destruction and inactivation ("masking") of natural hemolysins, the different hemolysins varying in their resistance; heating at 62° C. (143.6° F.) results in their total destruction.

These experiments indicate that the natural hemolysins in human sera are distinct substances and not complements. Natural hemolysins are susceptible to heat, being inactivated (masked) or destroyed when sera are heated at 56° C. (132.8° F.) and totally destroyed by heating at 62° C. (143.6° F.) The natural hemolysins in human



sera vary in resistance to heat, antishcep hemolysin being most resistant (thermostabile) and anti-guinea-pig hemolysin being most susceptible (thermolabile).

W. LINTZ.

BROWN, L., HEISE, F. H., PETROFF, S. K., AND SAMPSON, H. L. :  
A Preliminary Study of Clinical Activity. *American Review of Tuberculosis*, Dec., 1919, No. 10, p. 612.

*Pathological Activity.*—Pathological activity can always be safely assumed when clinical activity is present, but progressive pathological activity may occur for a longer or shorter time without evidence of clinical activity, and, again, retrogressive pathological activity can continue long after all evidence of clinical activity has vanished. Pathological activity must, of course, always precede clinical activity, but how long it may precede in cases which later become clinically active is difficult to determine. Pathological activity and physical signs can no more be correlated than clinical activity and physical signs. Many cases present symptoms of clinical activity a week or ten days before any increase of physical signs can be detected. Indeed, if the disease is apical, the indeterminate or indefinite physical signs may be misleading.

*Laboratory Findings.*—(1) *Sputum.*—The occurrence of tubercle bacilli in the sputum indicates pathological activity in about 90 per cent of all cases, but the absence of tubercle bacilli does not exclude activity. In 70 per cent of certain cases without sputum, pathological activity may be present. When tubercle bacilli occur after the administration of potassium iodid, or the occurrence of a mild acute disease of the upper respiratory tract, or of influenza, pathological activity may be indicated. The number of tubercle bacilli present in a specimen does not give any definite information regarding the pathological activity which their mere presence does not afford. In regard to their morphology and arrangement, short bacilli, even in clumps, give no further evidence of pathological activity. Much's granules and the presence of tubercle bacilli within certain cells in the sputum are of no especial importance for the determination of pathological activity. Elastic fibers in the sputum always indicate pathological activity.

(2) *Stools*.—Tubercle bacilli in the stools of adults have the same significance in connection with pathological activity as when they occur in the sputum.

(3) *Urine*.—The diazo, urochromogen, and Russo's methylene blue tests are of little value.

(4) *Blood*.—The numbers of the red and white cells are of no value. As slight changes of hydrogen-ion concentration may influence the agglutination of the tubercle bacilli, the authors do not feel that this phenomenon has proved of any value in determining the presence of activity. There is no evidence to show that any relation exists between precipitins and pathological activity. At the onset of pleural effusion, pathological activity can practically always be stated to be present.

*Complement-Fixation*.—The complement-fixation test in tuberculosis is specific, for up to this time no single protein lipid, lipoprotein or phosphatid has been found which can be used successfully as an antigen in tuberculosis. This leads us to the conclusion that the reaction is a true antigen-antibody complex, for any workable antigen must consist of the tubercle bacillus or its products. If we assume that Ehrlich is correct, then we must assume that a positive complement-fixation test indicates that the antigen either is or has been in the circulation, or that it indicates pathological activity, but of course not necessarily in the lung or organ under study. Further study suggests that the complement-fixation test is connected with pathological activity when there is an absorption of antigen. In a certain group of cases (the group with tubercle bacilli in the sputum, with parenchymatous x-ray lesion and symptoms of clinical activity) the test was positive in 95 per cent. In some cases with positive sputum at the time of the test the test was negative, which factors might be due to the absence of antibodies in the blood or to the presence of anti-antibodies.

*X-Ray*.—Pathologically active tuberculosis differs materially from the healed tubercle or resulting scar tissue. An attempt will be made to describe a limited field in the active process. Assuming that there is no scar tissue or calcification in this limited area, we see mottling with decidedly ill-defined margins, or a "cotton ball" appearance, as the authors prefer to call it, blending gradually with the surrounding lung tissue, which appears to be hazy or clouded. However, we often see shadows, more homogenous in character, to

which the term "sheet cotton-batting" might be applied. Assuming that this cottony or cotton-batting appearance indicates activity, as the disease retrogresses the tissue surrounding the cotton ball appears to become better aerated, and we recognize that the cotton ball is more compact and smaller. Or again we may see cotton balls (small ones) almost fade from view, leaving a more or less finely dotted appearance or little string-like shadows. As time goes on the mottling loses still more of its collateral haziness, the cotton balls become more compact and discrete, the ray filters through areas previously hazy, and the picture is that of a better aerated lung. Changes take place slowly. In the stage of ultimate healing, the plates as a whole show a preponderance of string-like or wiry shadows or dense, discrete mottling, either conglomerate or isolated. In the case of the progressive changes, the picture is somewhat reversed. New areas of mottling appear, often accompanied by a localized intrapulmonary cloudiness. This mottling is always of a cotton ball character. As a rule in the progressive changes, the predominant change is one of mottling, though at times the only change to be discerned is an increase of haziness surrounding previous mottling or linear markings. As the condition progresses we observe an accumulation of the shadows described above, the lung field becoming denser but not necessarily consolidating.

*Clinical Activity.*—The symptoms of the active condition have been divided into two groups from the standpoint of activity. The first group embraces fever, rapid pulse, pleurisy, hemoptysis, lack of endurance, loss of weight, and night sweats, the subsidiary group, chills, cough and expectoration.

In nine-tenths of the cases of relapse, the complement-fixation test was positive, and seven-tenths were clinically active, as compared with the cases in which the course was uninterrupted, one-half of which showed a positive complement-fixation test, while one-quarter were clinically negative.

If tubercle bacilli are present in the sputum, clinical activity is three times as likely to occur if râles are present, but even then only one-half of these cases are clinically active. If the tubercle bacilli are not present, then clinical activity occurs in only one-fifth of the cases, irrespective of whether râles are present or absent. In cases without râles, as many patients are clinically active when tubercle bacilli are absent as when they are present. Whether râles oc-



cur or are absent in cases with or without sputum is also of no importance.

C. SCHMID.

GREGG, A. L.: Eusol and its Intravenous Uses. *The Dublin Journal of Medical Science*, February, 1920, cxlix, No. 578, p. 68.

Gregg considers eusol, given intravenously, a valuable preparation in the treatment of severe cases of influenza and other toxemic conditions. Given in proper doses it relieves the toxemic cyanosis and causes a rapid clinical improvement in the patient. The best method of preparing eusol is as follows: Take 135 c.c. of the stable liquor calcis chlorinatæ of the "British Pharmacopeia", bring up to 1 liter with freshly distilled water, and add 10 grams of boric acid. This solution contains approximately .26 per cent of hypochlorous acid, .17 per cent calcium chlorid, and 1.28 per cent calcium biborate. It is best to make it of double strength and then dilute it with a double strength of sodium chlorid solution (1.7 grams per 100 c.c.), to make it isotonic. One hundred c.c. of this isotonic solution is the usual intravenous dose, and can be given at twelve or twenty-four hour intervals.

Gregg reports a series of 49 injections with no ill effects directly due to this preparation.

G. A. DISTLER.

LETZ, B. R., AND SCHNEIDER, E. C.: The Reactions of the Respiratory and Cardiac Centers to Changes in Oxygen Tension. *American Journal of Physiology*, 1919, 1, 327.

Reviewing previous experiments on asphyxia and low oxygen effects the authors note that they fail to distinguish clearly between the effects due to lack of oxygen and those due to accumulation of carbon dioxide. In their own experiments they have studied men and confined their attention to the early effects on the heart-rate and on the respiration of a reduced oxygen supply. They studied the

opposite condition, also, where either oxygen or normal air was given after the individual showed clearly the effects of oxygen deficiency.

The effects of anoxemia and restoration of normal oxygen tension on the pulse-rate and respiration were studied by having men breathe pure nitrogen. The results are as follows:

(1) The cardiac and respiratory medullary centers in man respond quickly to changes in the partial pressure of oxygen. Decrease of oxygen stimulates and increase of oxygen inhibits these centers.

(2) Heart acceleration occurred in from 5 to 55 seconds after the decrease in oxygen. In 66 per cent of the cases the acceleration occurred within 15 seconds. Heart retardation occurred in from 5 to 30 seconds after the increase in oxygen, in 86 per cent of the cases within 15 seconds.

(3) The partial pressure changes in oxygen exercise two different effects on respiration, rhythm and depth of breathing, with gradual, slow, oxygen reduction only the depth of breathing is increased. With a sudden oxygen reduction, the depth is increased first, followed by an increase in rate.

(4) The latent period for increase in the depth of breathing ranged from 4 to 35 seconds and averaged 14.5 seconds. For increase in rate the latent period ranged between 8 and 80 seconds and averaged 35.5 seconds.

(5) When the subject was returned to atmospheric air, the latent period for reduction in the volume of breathing varied between 3 and 24 seconds, averaging 6.9 seconds; for the rate of breathing it varied between 3 and 31 seconds, the average being 9.5 seconds.

(6) In all subjects at a barometric pressure of 380 mm. the administration of oxygen reduced the volume of breathing, and in some cases the rate was also decreased.

W. H. EDDY.

MORGULIS, S., AND LEVINE, V. E.: A Simplified Method for the Detection and Estimation of the Distribution of Morphin. *The Journal of Laboratory and Clinical Medicine*, Feb., 1920, v, No. 5, p. 321.

Morphin can be conveniently determined in food, or in tissues and body fluids, by heating with 2 per cent tartaric acid (if solid, the material should first be ground or finely minced) to convert all morphin into the soluble tartrate. The mixture is rapidly cooled, preferably on ice, to solidify the fatty material. The solid residue is removed by straining through cheese cloth, and washed until the washings are no longer acid to litmus. The liquid, after being filtered through paper, is evaporated to a pasty consistency. The tartrate is then decomposed by the addition of an excess of solid sodium bicarbonate which sets the alkaloid free. The evaporation is then continued to complete dryness, the mass powdered and extracted with chloroform to remove the free morphin. The volume of the chloroform extract is noted, and the smallest quantity of the extract is found which on evaporation (in a porcelain crucible over the water bath) leaves a residue which yields a definite morphin test. In this way the relative amount of morphin in several extracts can be determined; besides knowledge of the limit of sensitivity of the reaction an appropriate estimate of the amount of morphin in the original sample is possible.

The various alkaloidal tests can be applied to the residues after the evaporation of a portion of the morphin extract. The reagent employed, selenium dioxid dissolved in concentrated sulphuric acid, is very sensitive toward the opium alkaloid. While the limit of sensitivity for morphin may be regarded as 0.005 mg., yet for practical purposes the smallest amount that can be unmistakably identified as morphin with this reagent is 0.01 mg.

The authors conclude from their experiences with rabbits that morphin, whether given subcutaneously or by mouth, is widely distributed throughout the animal body, finding its way into almost every tissue. The morphin is invariably found in appreciable amounts in the urine and kidney. Also large quantities may be present in the alimentary tract, lungs, liver, and brain. According to their results especially large amounts of morphin were present in the alimentary tract and excretory organs after the administration of the poison by



mouth, while after it was injected under the skin it was recovered principally from the liver, excretory organs, and also from the lungs and brain.

We conclude, furthermore, that it is not advisable to limit the toxicologic examination for morphin to the alimentary tract alone, an examination of the kidney, urine and liver at least, being indispensable.

C. M. ANDERSON.

HAVENS, L. C.: The Importance of Biologic Classifications in Epidemiology. *The Journal of Laboratory and Clinical Medicine*, Jan., 1920, v, No. 4, p. 227.

The following considerations are set forth to show the practical necessity, in epidemiologic work, of a biologic classification of the microorganisms which cause disease. A morphologic classification is of course necessary, but we know that there are many species of streptococci, and of the bacilli of the colon-typhoid group, which cannot be differentiated morphologically but can be shown to be unlike by their cultural characteristics. In other words, they produce different appearances on artificial media; their ability to split sugars and the higher alcohols varies. Thus we have a further means of identification.

Former methods for the classification of bacteria disregarded the reactions which they arouse in their natural host, the animal body. The study of the measures used by the body to resist infection has progressed from empirical observation to the status of a separate science. From the observation that many diseases leave the individual resistant to a second attack has developed the science of immunology. One of the best known basic principles of immunology is that immune reactions are, as a rule, highly specific, that is, each race or "strain" of bacteria stimulates the production of antibodies when injected into the body, either naturally or artificially. Furthermore, these antibodies are specific for a small group, other groups, although morphologically and culturally identical, being often not included in the antibody formation.

It is rational to expect that a biological classification would bring out many points of interest in relation to epidemiologic studies of

disease. This is especially true with the pneumococcus, as it has been shown that an epidemic of one type may occur coincidentally with an epidemic of a second type, and that prophylactic inoculation against pneumonia may be rendered more efficient by the inclusion in the vaccine of representatives of all groups.

The meningococcus was formerly supposed, on the basis of morphologic and cultural evidences, to be a unit, and the serum treatment was followed by many failures, due to the fact that no biologic classification had been worked out. Now that we have a biologic classification, representative strains may be used, and a more universally potent serum is produced.

Recently the hemolytic streptococci have been classified biologically, and it has been found that the cultural characteristics have no relation to the biological grouping, the serologic types overlapping the cultural groups.

Biologic groups of the tetanus bacillus have also been found, and the inclusion of all the groups renders the antitoxin more completely successful.

A biologic classification of the colon-typhoid and of the diphtheria bacillus may be of help in successful therapeutics. Further investigation will be of great value.

C. M. ANDERSON.

KOLMER, J. A.: The Influence of Desiccation upon Natural Hemolysins and Hemagglutinins in Human Sera. *The Journal of Immunology*, Nov., 1919, iv, No. 6, p. 393.

Drying normal human sera upon cover glasses and in paper at ordinary room temperature frequently results in marked or complete deterioration of the normal isohemagglutinins, which is especially evident from the first to fourth days after the sera have been dried. Similar results were observed with hemagglutinins in normal human sera for the corpuscles of the lower animals.

Human sera containing large amounts of normal hemagglutinins when dried under ordinary conditions and properly kept in a refrigerator may prove satisfactory for microscopical tests for at least two weeks, due to the presence of sufficient agglutinins which have escaped destruction. Only such sera should be used for dry-

ing, and tests should be made at the end of the first week to determine whether agglutinins are present before the cover glasses are used for the typing of bloods.

The hemolysins found in normal human sera for the corpuscles of human beings and of the lower animals also deteriorate upon desiccation under ordinary conditions, and are somewhat more susceptible than the hemagglutinins. For the grouping of blood, sera should be kept in a fluid state, sealed in ampules at a low temperature, both hemagglutinins and hemolysins in normal human sera being highly susceptible to heat.

W. LINTZ.

OWEN AND MARTIN. The Ice-box Fixation Method in the Performance of the Wassermann Reaction. *The Journal of Laboratory and Clinical Medicine*, Jan., 1920, No. 4, p. 232.

The following conclusions were reached:

(1) Simple alcoholic heart extracts give the most reliable Wassermann reactions, provided the first phase of the reaction is carried out from 7° to 10° C. (44.6° to 50° F.)

(2) A period of from four to six hours at this temperature gives the best results. Longer periods (from twelve to eighteen hours) may give doubtful or weak positive reactions.

(3) We have found human heart extracts to be more dependable than beef or guinea pig heart preparations.

(3) Cholesterinized antigens, even when used in small amounts, will give false positive reactions in a considerable number of cases.

*Note.*—Since this article was written, Ruedinger (*Jour. Infect. Dis.*, 1918, xxiii, 173) and Wile (*Jour. Amer. Med. Assn.*, 1919, lxxiii, 1526) have reported uniformly better results obtained with ice-box fixation, than with the older methods of preliminary incubation at 37.5° C. (99.6° F.). Berhausen (*Jour. Amer. Med. Assn.*, 1919, lxii, 996) likewise advocates ice-box fixation, but states that he finds cholesterinized antigen very satisfactory and a fixation period of from eighteen to twenty-four hours at 0° C. (32° F.) the best.

C. M. ANDERSON.



BOUGHTON, T. H.: Studies in Protein Intoxication. IV. Histologic Lesions Produced by Injections of Peptone. *The Journal of Immunology*, Sept., 1919, iv, No. 5, p. 381.

*Conclusions.*—Intraperitoneal injections of Witte's peptone into guinea pigs produce lesions of the liver, heart, and kidney. These lesions consist in degeneration and necrosis of epithelium, followed by regeneration; edema of the walls of the smallest arteries, with endothelial proliferation; perivascular infiltration; and hyperemia. On postmortem examination the lungs are found to be expanded and the organs hyperemic. Both gross and microscopic lesions are very similar to those produced in guinea pigs by injections of native proteins.

W. LINTZ.

MAURIAC, P., AND MOUREAU: Studies on Leukocytic Fragility in Anaphylactic Shock. Proceedings of the *Réunion biologique de Bordeaux*, April 13, 1920. Reported in *La Presse médicale*, April 21, 1920, xxviii, 238.

The authors have reached the following conclusions, from repeated examinations of the blood of guinea-pigs suffering from anaphylactic shock:

(1) When the anaphylaxis is very marked and terminates fatally, the fragility of the leukocytes progressively increases, and the leukocyte count is diminished.

(2) When the anaphylaxis is marked, but the animal survives, the fragility of the leukocytes progressively increases, and the leukocyte count remains low. When the shock is at its height, with bristling hair, muscular twitchings and coldness of the ears, etc., there is a sudden fall in the leukocytic fragility and a rise in the leukocyte count. Several minutes after this crisis, the animal shows signs of improvement.

(3) When there is only a slight anaphylaxis, the leukocytic fragility remains almost unchanged.

S. KAHN.

## SECTION ON PEDIATRICS

REICHE, A.: Epidemic Influenza in Nursing Infants. *Deutsche medizinische Wochenschrift*, Jan. 15, 1920, xlv, No. 3, p. 75.

Reiche concludes that during the fall of last year (1919) the influenza epidemic in nursing infants was generally milder in its manifestations than in adults, while in endemic influenza, the course of the disease was characterized by as severe manifestations in infants as in adults. In these severe cases treatment was of no avail.

M. KESCHNER.

HAUSALTER, P.: Amyotonia Congenita (Oppenheim's Disease). *Archives de médecine des enfants*, Paris, March, 1920, xxiii, No. 3, p.133.

Hausalter quotes 3 cases illustrating the widely different conditions that are classed as amyotonia congenita. In the first case the mother stated that the fetal movements of this child were much less than those felt during the preceding seven pregnancies. The second case is remarkable, first, for the author's emphasis on the fact that a hideous monkey frightened the mother during gestation, and, secondly, for the improvement in the patient commencing at the age of four years. From complete mental and physical helplessness at four years, he progressed to a normal state, with the exception of laxity of the joints and muscular atrophy, at the age of eleven.

A border-line case between the Werdnig-Hoffmann and the Oppenheim syndrome is illustrated in the third case. Although the symptoms and the autopsy findings resembled those of a myopathy, the presence of the condition at birth forced the author to make the diagnosis of amyotonia congenita. An older child in this family had what was probably a similar disease.

W. C. DAVISON.

GARLAND, J.: The Occurrence of Acetonuria In Children. *Archives of Pediatrics*, Aug., 1919, xxxvi, 469.

From (734) consecutive cases admitted to the childrens' ward at the Massachusetts General Hospital, 17.3 per cent showed acetone in the urine. Of these 43.3 per cent were cases of respiratory diseases. Intestinal disturbances came next in order of frequency, 11 per cent. The symptom was found only in cases with fever, which ranged from 99.8° F. (37.66° C.) to 110° F. (43.33° C.).

It is pointed out that while acetonuria is a common finding, true acidosis as an entity is very rare.

Large amounts of fluids, alkalis, and a diet low in fat and high in carbohydrates, may be given to combat the condition.

T. B. GIVAN.

WALLIS, C. E.: School Dental Clinics and their Management. *British Journal of Childrens' Diseases*, 1919, xvi, 204-213.

This article is a discussion of the question of school dental inspection and how and where it is to be carried out.

The author feels that the children must be properly inspected by a dental surgeon and not by a school doctor, inasmuch as the latter, having no special training in the detection of caries, fails to detect the small, pin-hole, and interstitial cavities.

He feels that the age when the first annual inspection of the teeth is made should be under six years, as caries may exist which should have been treated at an early age. At the examination, no dental charting is done, but a record is made as to whether or not the child requires dental treatment. The dentist, in the opinion of the writer, should have experience in private practice, in the art of managing children and parents, and also the habit of working overtime. He does not approve of the young full-time man.

The anesthetist should be a man who has had experience in the administration of ethyl chlorid or nitrous oxid for dental purposes. It is essential that a nurse be provided to assist the dentist. A supervising dentist should visit the clinic periodically and also see to it that the work is properly coördinated. Trained women, known



as dental hygienists, may be employed to pay routine visits at various schools, in order to carry out the surface treatment of children's teeth. Wallis calls attention to the advisability of the development and coördination of mothers' and infants' welfare centers in connection with the dental clinics.

M. B. GORDON.

COMBY, J.: Maternal Nursing Above Everything. General Review. *Archives de médecine des enfants*, Paris, March, 1920, xxiii, No. 3, p. 184.

Rousseau in l'Emile awoke interest in breast-feeding in the 18th century. The practice fell into disuse during the 19th and 20th centuries. In 1919 there were more than 10,000 babies in Paris who were not nursed by their mothers. In Tour, in order to reduce the existing 50 per cent mortality in the Foundling Home, mothers were encouraged to remain from three to six months in the institution and receive board and lodging and 25 cents per day, on condition that they nurse their infants. The infant mortality then fell to 2 per cent. Similar homes for nursing mothers have been opened at Nanterre and other centers, the one at St. Benigne (Ain) being supported through a grant of \$2,000 from the American Red Cross. Among the wealthy, nursing should be encouraged by propaganda.

W. C. DAVISON.

GARCIA DEL DIESTRO, J., AND CORDERO, B.: The Therapeutic Use of Tuberculin by the Intradermal Route in Pulmonary Tuberculosis of Children (A propósito del empleo terapéutico de la tuberculina por vía intradérmica en la tuberculosis pulmonar de los niños.) *Archivos españoles de pediatría*, Jan., 1920, iv, No. 1, p. 5.

The writers begin by admitting that the ambulatory treatment of pulmonary tuberculosis by the hypodermic administration of tuberculin is always accompanied by difficulties and dangers. In view of these dangers they resolved to try to emulate the brilliant results obtained by the use of the intrademic method by L. Jeanneret in the

Basle Sanatorium. According to Jeanneret there are two main advantages offered by the intradermal injection of tuberculin. The first is that it is unnecessary to obtain a marked general systemic reaction, to make sure that a therapeutically active dose has been administered. The second is that it is possible, by this method, to observe the tolerance of the patient toward tuberculin, at any time, without the ordinary data as to the elevation of the temperature, the weight, etc. In this preliminary report 4 of the early cases of a series of 50 are studied. While the treatment had no effect, in these cases, upon the anatomical extent or condition of the lesions, nevertheless it seemed certain that the general condition of the patients, especially in regard to body weight, was appreciably better than was the rule with control cases of approximately the same extent of lung involvement.

A further and complete report on the remaining cases of the series will be published shortly, together with details of technic, dosage, and the pitfalls to be avoided.

W. H. DONNELLY.

JUARISTI, V., AND ARRAIZA, D.: Multiple Omental Cysts. *Archivos espanoles de pediatria*, Jan., 1920, iv, No. 1, p. 20.

This was a case of a remarkably well-nourished boy of four years whose abdomen was enormously distended with liquid, the nature of the condition being difficult of diagnosis in view of the apparently perfect health of the patient.

Exploratory laparotomy revealed an enormous collection of cysts of the gastrocolic omentum varying in size from that of the adult fist to that of a small nut; they were all united. Practically the entire omentum was resected, but eight days after operation a steadily rising evening fever prompted a second laparotomy, which revealed that a small cyst had been left behind and had begun to suppurate.

Removal of this cyst caused the fever to disappear, and the discharge, which had been profuse, rapidly diminished and soon ceased, the patient making an uneventful and complete recovery.

W. H. DONNELLY.

SECTION ON  
ROENTGENOLOGY AND ELECTRO-  
THERAPEUTICS

A Collective Abstract of the Literature on Roentgenology for the  
Year 1919.

By I. SETH HIRSCH

*General*

[Roentgenology is at the present time very much in the same state as pathology was when Virchow (Postmortem examinations, Virchow, translated by T. P. Smith, Philadelphia, 1877), after commenting on and criticising the irregular, unmethodical method of performing and reporting post-mortem examinations, without any technical plan, wrote: "On the other hand it was necessary to discover a regular method of pathological, anatomical investigation and to introduce the definite employment of technical terms which could be adhered to as a rule for ordinary cases." Thus the needs at the present time in the roentgenological field appear to be the establishment of the status of the roentgenologist, the outlining of his functions, the determination of the method by which his reports shall be rendered, and the enlargement of the scope of his examinations, so that the individual as a whole, as well as the particular organ under scrutiny, may be considered.

Who is a roentgenologist and what is he, that restless and disconsolate he wanders about the medical world in alternating moods of despondency and belligerency?

Is he a man skilled in things electrical, who stands beside the shining switchboard and throws the lever which turns the current into an *x*-ray tube, placed in a certain relation to a part of the body and to a sensitive plate? Is he a man who studiously contemplates a photographic image of shadows, recording tissue densities, and whose interpretative language must confine itself to a soulless description of shadow values?



Is he a marvellous mixture of anatomist, physiologist, clinician, diagnostician, pathologist, therapist, director of surgical technic, a "*multum in parvo*", a newly-created personality, resulting from a re-alignment in our medical organization? If the former, then there is cause for his despondency. If he is the latter, is his belligerency justified?

Perhaps it would be more conducive to a certain emotional equanimity, could he, in an impersonal way, analyze these viewpoints. He would then see that the former view is that held by the world he moves in, and the latter view the one he has of himself.

He is neither the supreme authority on the art of diagnosis, nor is he an electrical technician, forbidden to utilize the gift of clinical medicine which it is his privilege to possess. When the thought dawns on him that he is not the whole medical army rolled into one, but only one of the many scouts bringing his quota of information to the master, who pieces together the various impressions, giving each its proper value, and thus preparing plans for a successful attack, then he will have reached the mental attitude which will permit him to find his proper place in the medical cosmos.

That there appears to be a tendency upon the part of the clinician rather to depend entirely and blindly upon the roentgen examination, than to study the case by all the varied methods at his disposal, is lamentable. The checks by which diagnosis is elaborated, refined, and rendered accurate are thus ignored in the attempt to find a direct road to the solution of the problem.

The roentgenologist, the author believes, is gradually assuming his proper function, and is contented to serve in the capacity of a contributor of a quota of valued data. But all our clinical and laboratory methods will attain their full value, to the great advancement of diagnostic medicine, only when the clinician learns to properly utilize and interpret the results of the roentgenologist's contribution.]

Francis Hernaman-Johnson, M. D., writes on this topic (*The Place of the Radiologist and his Kindred in the World of Medicine*, *Archives of Radiology and Electrotherapy*, Nov., 1919, xxiv, 181) and argues that the roentgenologist is in a sense a consultant whose opinion is elicited by the medical man referring the case to him. The roentgenologist should concern himself with diagnosis, and his function is to study living pathology, to correlate clinical

and roentgenoscopic findings, and *to interpret* the plates which he makes or has made for him.

In reference to the technician, he suggests that it is necessary:

- (1) To organize and educate the various classes of lay helpers.
- (2) To see that their status, remuneration, and prospects are such as to make them contented.
- (3) To educate the public as to why such people are at one and the same time invaluable as helpers, and extraordinarily dangerous when they seek to practice independently.

The partial practice of roentgenology and electrotherapy by men with regional specialties is a subject which should be briefly referred to. It is often the hard fate of the roentgenologist to work out some procedure which is first abused, then ignored, and finally adopted by men in other branches of the profession. The use of *x*-rays in ovarian and uterine troubles is one instance; the employment of electricity for weakened or paralyzed muscles is another. The gynecologist has, to some extent, appropriated the one, the orthopedic surgeon the other. To grumble is futile; we should rather appreciate the compliment of imitation.

The actual production of the plates may or may not be carried out by the roentgenologist; if large numbers are concerned, it is certainly a gross waste of time.

Thus we are confronted with the problem of the lay operator. There are still a few roentgenologists who hold that even the switches on their apparatus are sacred, and that none save the initiated may touch them.

The fact that intelligent laymen can produce plates as nearly perfect as present conditions permit cannot be gainsaid.

The custom of distributing *x*-ray prints broadcast, which was so prevalent a few years ago, did much to make the public regard the roentgenologist as a sort of glorified tradesman who was paid for taking photographs.

Despite the necessity for the large measure of freedom outlined above, one limitation may be accepted, i. e., a cast may be seen with a view to diagnosis only. But, within this wide boundary, there must be no restriction, except, in private practice, what may be determined by the patient's circumstances. The examination of one

kidney alone is quite inadmissible, and even an investigation of the entire urinary tract is by no means always sufficient. Every roentgenologist knows that the elucidation of the cause of some vague abdominal pain may call for all the resources of his art. An examination by the opaque meal and opaque enema, and separate examinations for gall-stones, pancreatic calculus, renal calculus, and ureteral kink, may be indicated in a single case, and some of the tests have to be repeated.

In conclusion, the author sums up as follows the ideals for which, as a body, roentgenologists should strive:

(1) They should seek a freedom of judgment and action equal to that of the best type of modern surgeons, and justify it, as they do, by a familiarity with all that pertains to the general progress of modern medicine.

(2) They should gain a reputation for being as fully acquainted with their limitations as they are cognisant of their powers, and should seek to impress upon the public mind their belief that in coöperation and combined treatment lies the key to progress.

(3) They should welcome lay assistance, and seek to organize and guide it. It is too late in the day to make a mystery of taking plates, but the interpretation of them will always be the prerogative of the roentgenologist.

They must determine also, with the larger view of a general consultant, what organs are to be examined, since the particular examination indicated by the referring physician may not disclose the true nature of the malady.

Thus the *Journal of the Indiana State Medical Association* puts the case very well when it says editorially that the development of roentgenology, and especially the practical uses to which the roentgen-ray may be put as an aid in the diagnosis and treatment of diseased conditions, has resulted in a widespread sale of roentgen-ray outfits to doctors and dentists of every description. The real value of roentgenology has been distorted and perverted through the ignorance and lack of experience of many men who have used their roentgen-ray outfits as a means of broadening their sphere of activity, but without properly appreciating the fact that roentgenology is a specialty in itself, and one which requires a long apprentice-



ship of study and experience before it can serve efficiently and well as an adjunct to the successful practice of medicine or dentistry. The average man who owns a roentgen-ray outfit merely dabbles, and makes a bad mess in the practice of what is really a highly specialized science, and while he develops a few facts in the simpler cases which aid him in his general work, in a far greater number of cases he arrives at erroneous conclusions as a direct result of his lack of technic and lack of experience in interpreting his results. In fact, to the average physician many roentgen-ray plates are a mystery which he never solves.

Roentgen-ray work, like other highly specialized work, should be in the hands not only of those who devote most of their time to it, but of those who have equipped themselves with the latest and best apparatus and who, through training and experience, are best able to apply intelligently the apparatus they possess and to properly interpret the results.

There is an old saying that the man who attempts to do everything does nothing well, and this applies to the profession of medicine as well as it applies to a trade. Roentgenology is a specialty, and if we are to obtain the best results from roentgenology for the benefit of suffering humanity we must depend upon the specialist in roentgenology; and this applies not only to the application of the principles of roentgenology, but to the interpretation of the results. There are many roentgen-ray plates which even a layman can interpret, but, on the other hand, there are many other roentgen-ray plates which must be interpreted by the man of wide experience and intensive training.

[The roentgenologist should use definite, accepted terms, to express the characteristics of that record of density which we call a roentgenogram. Unfortunately it took a long time before the individual workers were contented to express their ideas in a few plain terms, based upon the fundamental truths that the roentgenogram is nothing but a record of tissue density, ranging from white to black. Until recently there was in use a babel of almost unintelligible terms, such as haziness, weavings, arborization, stripping, cloudings, knottings, and similies drawn from zoölogy and orthography, resulting in great lack of definiteness in methods of description.

The plate should therefore be analyzed on the basis of shadow

values, in terms of shadow values. Then the normal shadows should be differentiated from the abnormal, and finally the abnormal shadows interpreted in the light of pathological and clinical knowledge. All this may seem very trifling and superfluous, but words are the instruments of expression. They are the tools by which various workers, delving in the darkness, make known to each other their progress in the search of the secrets of life. And it is only when the roentgen readings are made according to a systematic, definite method of analysis, based on a scheme having for its foundation the gross pathological tissue changes, expressed in the proper language, in terms of shadings, on the basis of the term "illumination," that results will be obtained which will permit the harmonization of the views held by the worthiest representatives of the art. At present any one reading reports must echo the complaint of Montaigne, that there is more ado to interpret interpretations than to interpret things themselves. Thus such expressions as "a solid shadow in the upper part of the lung", "increased density over the lower right thorax", "infiltration and thickening of the hilum shadows", "haziness and clouding of the left apex", "demineralization of the left pelvis", are mere gibberish, because the shadow descriptions are confused with pathological and anatomic conditions. Thus "clouding of the left apex" is perhaps intended to mean that there is a diminution in the illumination of the apical portion of the left pulmonic field, and "an increasing density over the right lower thorax" means a great diminution in the illumination in the lower right pulmonic field.]

Cole (Roentgenology as a Method of Studying the Natural History of Disease. *American Journal of Roentgenology*, Feb., 1919, vi, 72) states, as a further comment on the function of the roentgenologist, that the value of the roentgenogram is directly in proportion to the accuracy with which the roentgenologist interprets pathological lesions on the basis of these varying densities. The accuracy with which this is done is directly dependent upon the breadth and depth of the roentgenologist's knowledge of pathology.

Like pathology, roentgenology has become the science of the study of diseased tissues, and the interpretation of the findings is in terms of pathology, not necessarily of etiology.

That there may be no misunderstanding, it is necessary to clearly define what is meant by "roentgen findings" and how they differ from "roentgen diagnosis."

The term "roentgen findings" is applied to varying densities of the plate caused by the interposition of normal or diseased tissue. Such terms as "filling defects" of the stomach, "cloudiness" of the left apex, or an "increased density" over the right lower thorax, are simply descriptions of varying densities of the plate and are not expressions of pathology.

The roentgenologist is efficient or inefficient according to his ability to interpret correctly the roentgen findings in terms of pathology.

Cole protests against the roentgenologist making the roentgen diagnosis on the basis of the clinical history.

If the roentgenologist is to become more than a technician he must have a thorough knowledge of pathology. Cole maintains that pathology is the foundation on which roentgenology must be built, and he also has a vision of roentgenology contributing more materially to pathology.

Roentgenology gives a clear-cut idea of deviations from the normal without the distortion incident to the removal of the parts at the time of necropsy. The removal of the lungs breaks up the adhesions and destroys the pockets, which are most important in the study of the "natural history" or clinical course of an empyema. Roentgenology, combined with pathology, is the method *par excellence* for the study of the natural history of certain pathological processes, particularly those of bones, lungs and certain parts of the gastro-intestinal tract.

Cole considers that roentgenology as a method of studying the natural history of disease has advantages over pathology.

Gross pathology, in an individual case, is limited to the study of the progress at a single stage of its development, usually a late stage. The progress of the pathological process has been deduced from the study of a large number of patients dying at different stages of the disease. Therefore the natural history of the pathological process has been determined by a series of autopsies on similar cases, together with the clinical history of the patient.

After it has been established by a comparative roentgenological and pathological examination that a certain pathological process causes characteristic roentgen findings, the course or natural history of that pathological process may best be studied by a series of roentgenograms of an individual case made during the course of the disease.



The following is a list of some of the pathological processes in which periodical roentgen examination is of practical value, not only in the study of the causes of the disease, but also as a factor in determining the method of treatment to be pursued, and whether or not surgical procedure is necessary:

- (1) Pneumonia    { Pneumococcus  
                      { Streptococcus
- (2) Empyema     { General  
                      { Sacculated
  - A. Diagnosis
  - B. Indications for surgical procedure.
  - C. Location of incision.
  - D. Location of accessory pockets if present.
- (3) Pleurisy with effusion.
- (4) Pulmonary tuberculosis.
- (5) Pericarditis.
- (6) Mastoiditis    { Diagnosis  
                      { Progress
  - A. Before operation.
  - B. After operation.
- (7) Sinusitis.

In the roentgenological as well as in the pathological study of an organ the findings must not be considered as characteristics of an isolated structure, but the relationship of the organ to all the others and to the body as a whole must be considered. In the study of the diseases of the viscera even such extraneous factors as skeletal musculature, subcutaneous fat, the size, shape and condition of the bones, must be considered, not to mention the importance of examining the other organs for associated lesions. Negative results in the examination of one organ do not preclude the existence of a lesion in another organ.

Crane (Coexisting Multiple Lesions as Causes of Diagnostic Errors. *American Journal of Roentgenology*, June, 1919, vi. 264) attempts to classify his experiences on this point, and is lead to the conviction that in a large proportion of cases multiple pathologic processes coexist, and that an important factor of error does result from the failure to examine patients fully by combined methods of diagnosis.

The 395 cases of multiple lesions which confute this dictum may be subdivided into (a) 122 cases in which several diseases formed chains of cause and effect, and (b) 273 cases in which there were two or more unrelated diseases forming true multiple lesions.

Although acute diseases may be multiple, as, for example, pneumonia in the course of influenza, the more chronic the case the more probable is the existence of multiple lesions. An acute condition may be grafted upon a chronic disease.

The distinctions between a single disease affecting several organs and a chain affecting several organs may be absent in some cases.

If, however, appendicitis leads by reflex action to gastric hyperacidity and ulcer, this is clearly a chain. Such a chain is seen in gall-stones with diabetes. The initial lesion may have been typhoid fever causing a cholecystitis. From the cholecystitis gall-stones result. As is well known, living typhoid bacilli have been grown from the nuclei of gall-stones. From an impacted stone in the common duct a temporary occlusion of the pancreatic results, with the production of a low grade pancreatitis, and ultimately of diabetes, due to a disturbance of the internal secretion of the pancreas, as shown by Opie many years ago. As a predisposing factor of the diabetes, pulmonary tuberculosis may supervene; or gangrene or even a destructive lesion of the phalanges of the big toe may be indirectly responsible. The roentgenologist may be called in on the case because of the gall-stones, or the pulmonary complication, or perhaps because of the necrosis of a bone in one toe. If a diagnosis were attempted without a survey of the case it is easy to see how misleading might be the apparent indications for treatment.

An example of a diagnostic chain which closely concerns the roentgenologist at present is one which begins with dental sepsis as shown on tooth films, and may result in several simultaneous lesions such as an arthritis, a cardiac valvular lesion and nephritis. Of the forms of arthritis thus caused we may especially mention spondylitis deformans because of the frequency with which the pains of this affection are mistaken for those of thoracic, abdominal or renal diseases. The septic focus may be a tonsil, an infected sinus, a salpingitis, etc., and the secondary lesion may involve any organ of the body.

Grover and Christie, analyzing 1,300 cases referred for gastrointestinal study, insist on the importance of chest examination in

such cases (*American Journal of Roentgenology*, August, 1919), and emphasize the danger of limited examinations and the importance of a more general roentgen survey of somewhat obscure cases.

The fact that gastro-intestinal symptoms frequently have their source of origin in lesions above the diaphragm is not sufficiently recognized.

Of the 1,300 gastro-intestinal cases forming the basis of this report the authors were able to demonstrate actual pathology in 506, or a little less than 39 per cent. Of this number the lesion was found to be in the chest in 170, or a little more than 13 per cent, or, by excluding the 198 cases in which the chest was not examined, a little less than 15 per cent. In other words, they found only about twice as many gastro-intestinal lesions as chest lesions in cases referred for gastro-intestinal disturbances.

With respect to the lung lesions this question may be unhesitatingly answered in the affirmative. This group comprised 98 cases, of which 84 were tuberculous. The remaining 14 comprised cases of pleural effusion, unresolved pneumonia, spontaneous pneumothorax, malignant disease, plural adhesions and bronchiectasis. The tuberculous cases comprised about 6.5 per cent of the total number referred for examination. Coincident lesions of the lung and gastro-intestinal tract were noted in only 6 cases.

Most of the tuberculous cases were of a chronic, slowly progressing type, many of them showing extensive infiltration and fibrosis, but which nevertheless had escaped recognition throughout years of semi-invalidism. It is of interest to note that the authors found pulmonary tuberculosis in almost exactly the same percentage of cases as duodenal ulcer, and it would thus appear that the two lesions deserve equal consideration in cases referred for gastro-intestinal study.

The cardiovascular group comprised 69 cases, or slightly more than 6 per cent of the cases in which the chest was examined. A conspicuous enlargement of the heart or aorta was the determining factor upon which the presence of pathology was predicated. There was 1 case of aortic aneurysm. It is to be noted that coincident lesions of the cardiovascular and digestive systems were more than twice as frequent as in the pulmonary group. The gastro-intestinal examination should in all cases be preceded by an examination of the chest.

(To be continued)



GAILLARD, J.: Radioscopic Examination of the Heart and Aorta in the War Tachycardias. *Société médicale des hôpitaux de Paris*, May 9, 1919, xliii, 426. (Abstr. in *Archives des maladies du coeur*, 1920, xiii, 40).

Orthodiagraphic examination of 34 patients with irritable heart showed 15 cases with normal heart and aorta. In 2 cases the heart was normal but there was widening of the transverse arch of the aorta. In 14 cases there was more or less marked hypertrophy of the left ventricle and one of these also showed a wide transverse arch. Four cases showed distinct widening of the aorta.

M. H. KAHN.

BARJOU, B.: The Atonic Appearance of the Digestive Organs among the Nervous—A Study in Clinical Radiology. *Lyon médical*, Feb. 10, 1920, cxxix, No. 3, pp. 109-115.

In nervous patients, *x*-rays often give pictures of the digestive organs similar to those seen in certain general atonic states.

(1) *Esophagus*.—*X*-rays often show marked changes in deglutition in patients who are presumably suffering only from functional disturbances. Usually the trouble is limited to the swallowing of solids. Instead of entering the stomach at once, like a falling stone, or more slowly, but continuously, the meal progresses irregularly with many stops, as if there were obstructions to the passage. Each stop is more or less long—from several seconds to a minute. Often it is necessary to swallow some water before the meal passes from one stop to another. The number of times the meal is suddenly arrested varies from two to seven. The appearance differs from that due to stenosis in that the stops are not uniform and in that one does not see antiperistalsis.

(2) *Stomach*.—The stomach is usually ptosed, often distended, never dilated. Contraction waves are much diminished. Occasionally several violent contractions appear, only to end very quickly, as if all the power of the stomach musculature were gone. Usually the waves are slow and weak, and have almost no emptying effects. But in from three to four hours, the stomach is empty.

(3) *Intestines*.—In the small intestine, the passage of the food

is usually normal. Occasionally it is retarded. The colon is often markedly ptosed.

The patients are usually of the emotional, neurasthenic type. They present many associated neurologic symptoms—e. g., hyperesthesias, absence of corneal and pharyngeal reflexes, etc. They ascribe their gastro-intestinal troubles to their nervousness.

It is important to recognize this condition, because surgical interference is harmful in such cases.

S. KAHN.

DUMAS, A., AND CORONE, A.: The Value of Radioscopy in the Diagnosis of Pleuropulmonary Tuberculosis. *Lyon médical*, Jan. 20, 1920, cxxix, No. 2, pp. 61-75.

After an exhaustive study, the authors reach the following conclusions:

(1) Roentgenoscopy is an excellent method for determining the anatomic condition of the organs—as verified by careful postmortem examinations.

(2) In cases in which clinical laboratory findings are not diagnostic, but where the physical findings are definite, the *x*-ray confirms the diagnosis.

(3) In certain doubtful cases, roentgenoscopy often furnishes grounds for a brilliant diagnosis of tuberculosis, before the physical findings are clear.

(4) In latent conditions, *x*-rays will demonstrate the arrested lesions clearly.

S. KAHN.

BERRY, M.: *X*-rays in the Early Diagnosis of Pulmonary Tuberculosis. *The British Journal of Tuberculosis*, Jan., 1920, xiv, No. 1.

Since functional derangement frequently precedes visible structural change, it is necessary to look for the earliest manifestations of the disease on the fluorescent screen. The axiom is: screen for func-

tion, plate for structure. The *x*-ray plate demonstrates structure and gross structural change, but there is a stage of infection earlier than this in which no gross structural change is evident and in which it is highly desirable to make a diagnosis.

The importance of diaphragmatic movements was realized early; but in the experience of the present writer there is a stage even earlier than that of actual limitation. This he describes as one of hesitation.

In a typical case it will be seen that the diaphragm on the affected side commences its descent a fraction of a second later than on the sound side. Frequently it descends in a series of jerks instead of in an even sweep, but has the same range of movement as the healthy side. Later in the course of the disease there may be actual limitation of movement. Concurrently there may be limitation of costal movement on the affected side, the effect being to diminish the entrance of air into the diseased lung. If the amount of air admitted is greatly diminished this will be seen on the screen as a failure to light up during inspiration. The actual limitation can always be observed when present, and implies diminished admission of air. This is one of nature's efforts to give rest to the infected lung.

This limitation of the diaphragm may be caused by pleural and abdominal conditions, and these must be excluded, in arriving at a correct diagnosis. But an impaired percussion note on inspiration is often found in cases which show no detectable organic change but do show functional derangement of the diaphragm.

C. F. NICHOLS.

RIBADEAU-DUMAS, MALLET AND DE LAULERIE: Radiologic Studies of the Kidneys with Artificial Pneumoperitoneum. *Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, March 25, 1920, xxxvi, No. 11, pp. 418-422.

Until recently, roentgenologic exploration of the kidneys gave very poor results, its value consisting chiefly in detecting calculi.

After the injection of from 1 to 2 liters of oxygen into the peritoneal cavity, the kidneys appear very clearly, with outlines as definite as those of the heart.



For a careful examination, there are three positions which should be used:

(1) The left lateral recumbent—with the rays striking horizontally in the sagittal direction. This position shows the outer surface of the right kidney, and its relation to the liver.

(2) The right lateral recumbent—with the rays falling in the same way as previously. This reveals the outer surface of the left kidney, and its relation to the spleen.

(3) The abdominal recumbent—which gives a view of both kidneys synchronously, and their relation to the liver and spleen.

S. KAHN.

DUFOURMENTEL, L.: Radium Treatment of Cancer of the Esophagus (*Le traitement du cancer de l'oesophage par le radium*). *Paris médical*, Paris, Feb. 7, 1920, No. 6, p. 124.

For the scientific treatment by means of radium of this most formidable disease it is necessary:

(1) To eliminate any possible diagnostic error.

(2) To know the exact level at which the tumor is located, its size, and the amount of stenosis which it provokes. We must know whether or not it is ulcerated, nodular, or whether there is any kind of dilation above or below the growth. Only in this way will we be able to avoid the accidents which render esophagoscopy dangerous. This data can only be obtained by the use of the esophagoscope supplemented by a fluoroscopic examination of the patient.

After all the data have been collected the treatment may be begun. Two methods may be used:

(1) *Direct Method*.—The esophagoscope is introduced until the new growth is reached. Very frequently the tube crosses a diverticulum full of saliva and debris. The end of the tube rests upon an infiltrated mucosa or directly upon the tumor nodules. The caliber of the esophagus is determined by means of sounds of increasing thickness. After the approximate caliber is obtained a soft, hollow, sound is introduced, and inside of it the tube containing the radium

is placed. The esophagoscope is taken out and the sound fixed by the most convenient means.

(2) *Indirect Method* (without the esophagoscope).—A soft hollow, rubber catheter is introduced, at the point of which the tube containing the radium is fixed. The introduction may be controlled by the *x*-rays.

Needless to say, both methods require a thorough local anesthesia and great skill on the part of the operator. The dosage and time of exposure differ according to the lesion, and their determination had better be left to a specialist. The dosage used by the author, following the advice of Dr. Belot, was from 25 to 50 mg. of radium bromid (salt), and the time varied from six to ten hours, according to the tolerance of the patients. The number of exposures varied from two to six.

The difficulties arise from the necessity of keeping the sound in the esophagus for two hours at least. To prevent vomiting local anesthesia is of vital importance. The author has sometimes used general anesthesia.

The treatment must be completed with the following measures:

(1) *Soft Diet*.—Only liquids, mashed fruits and vegetables should be given, and also cereals.

(2) *Tonic Medication*.—This consists in beef juice, hemoglobin, iron, and arsenic. The latter is prescribed as arsenate of strychnin,  $\frac{1}{2}$  or 1 mg. daily.

(3) *Soothing Medication*.—It is very important that patients should sleep well. For local use the author prescribes the following formula before meals (1 teaspoonful):

Adrenalin 1 to 1000.....	gtt. 30
Cocain hydrochlorate.....	1 gram
Simple syrup and water.....	aa. 100 c.c.

The author gives the results obtained in the case of 2 patients. The improvement was marked, although the cure was never complete; they gained weight and were able to attend to their daily occupation. The author considers these results encouraging as compared with the former impotence of the physician in the presence of cancer of the esophagus.

C. F. ARROYO.

ZIMMERN, A.: Pathological Conception of the So-Called Primitive Neuralgias and Their Treatment by the X-rays (La conception pathogénique des neuralgies dites primitives, et leur traitement radiothérapique). *Paris médical*. Paris. Feb. 7, 1920, No. 6, p. 105.

The etiology of neuralgia cannot be traced very often to a clear trouble which might satisfactorily explain the presence of pain. The author discusses the disease. These neuralgias, when their cause is suspected, are usually called rheumatic, *a frigore*, arthritic; but when the cause remains altogether uncertain we call them primitive, *sine materia*. Notwithstanding the uncertainty of their etiology modern studies seem to explain in a most satisfactory way the origin of those pains. The root of any rachidian nerve, after passing through the meningeal veil, traverses the vertebral bony fenestra and is surrounded by cellular tissues and the rachidian veins. It is obvious that in such a location the nerve is liable to be involved in the disturbances of adjacent organs. When the lesion affecting any of the surrounding organs, as, for instance, in a tuberculous process or in cancer of the rachis, is very extensive, the neuralgic pains are constant and intense. Everybody knows the pain endured by patients suffering from cancer metastasis of the rachis.

In accordance with the above anatomical data the neuralgia would seem to have its origin in the root of the nerve, that is to say, the site of the lesion is vertebral or juxtavertebral. According to Sicard and Leri this is the pathogenic explanation of all cases of sciatica. If we admit this we may also assume the same etiology for the other forms of neuralgia. This can be proved in the case of brachial neuralgia. When one of the lower cervical vertebrae is percussed, a painful sensation is produced which irradiates along the neuralgic limb.

Another fact in support of the pathogenic theory stated above consists in the good results obtained in sciatica, as well as in other forms of neuralgia of obscure origin, by irradiation of the affected nerve on its point of emergence from the vertebral channel. This theory, although it explains to a certain extent the immediate cause of neuralgia, fails to explain its remote cause. This, the author thinks, is due to a generalized trouble, revealed by the vertebral lesion, and which must be looked for if a complete cure is to be ob-



tained. The author explains the presence of this generalized trouble by occurrence of what he calls neuralgic metastasis, that is, neuralgias of another nerve, which appear after the first neuralgia is cured.

He gives the histories of 4 cases of brachial neuralgia treated with weak doses of roentgen-rays, in which he obtained marvelous results. One or two irradiations of 3H. was all that was needed to cause the pain to disappear. The filter used was of aluminum 2 or 3 mm. thick. The irradiation covered the surface extending from the fourth cervical to the first dorsal vertebra. The direction of the rays was slanting from back to front and from the outside inward. After the treatment a painful reaction sometimes appeared, preceding the sedative action of the rays. The dose given above, even if repeated at weekly intervals, will never provoke erythema, and if proper filtration is applied, pigmentation of the skin is not to be feared.

C. F. ARROYO.

DOUMER, E.: Treatment of the Tuberculous Osteitis by Means of High Frequency and High Tension Currents (*Traitement des osteites tuberculeuses par les courants de haute fréquence et de haute tension*). *Bulletin de l'Académie de médecine*, Jan. 27, 1920, No. 4, p. 93.

The author refers to an early article of his on the same subject. He says that the long time that has passed since his first communication was published has enabled him to confirm his conclusions as to the persistence of the cures. Later experiments have thoroughly supported his ideas regarding the electrical treatment. He submitted the patients to the action of very strong electrostatic alternating currents with a voltage of more than eighty thousand volts and with from eight hundred thousand to one million oscillations in a second. Every treatment lasted ten minutes and the treatments were given daily or every other day, according to the patients' condition. Out of 4 cases he has obtained 3 cures that have lasted for six, seven and eight years respectively. In the fourth case the condition recurred three years after an apparent cure. Some patients are cured after a treatment of a few weeks, while in other

cases it takes months and years to effect a cure. The method is especially successful in osteitis localized in the foot. The duration of the course of treatment depends upon the depth at which the lesion is located. Some very deep lesions are quite out of reach of the action of the current.

The osteitis of the fingers, such as whitlow or spina ventosa, are very rebellious to treatment. The author says that a treatment which at first seems unsuccessful may be efficacious after some time. For this reason treatment should be continued for a long time before the physician gives up the hope of obtaining results. The treatment should be accompanied by hygienic measures and by immobilization of the affected organ if possible. Every form of osteitis should be treated by this method before more radical measures are attempted.

C. F. ARROYO.

HONEIJ, J. A.: Cavity Formation and Annular Pleural Shadows in Pulmonary Tuberculosis. *Archives of Internal Medicine*, Jan., 1920, xxv, No. 1, p. 63.

From an elaborate analysis of many plates, checked up in many instances at autopsy, the author presents his impressions on the differential diagnosis of annular shadows. These include the true tuberculous cavitations, the annular shadows of pleural origin, and the ring-like shadows sometimes seen as a result of the crossing of two arched and thickened bronchi. The second variety are not infrequently found in the presence of pulmonary disease. They are, however, usually larger than true cavities and are not so apt to occur at the apex. They are more superficial, and are apt to appear on an even plane. They are less apt to be circular than are most cavities, and part of the circumference may be irregular and indefinite. The false annular shadows of bronchial origin can usually be readily differentiated by means of stereoscopic plates.

T. HOWARD.

SECTION ON  
NEUROLOGY AND PSYCHIATRY

"ENCEPHALITIS LETHARGICA"

A COLLECTED ABSTRACT

BY SMITH ELY JELLIFFE, M.D., Ph.D.

(Continued from page 301)

The cardinal symptoms may first be divided into (a) general, and (b) focal.

(a) *General Symptoms.*—The onset may be extremely variable. In the vast majority of the cases—one does not yet attempt to separate so-called influenzal, poliomyelitic, or other types—the patient has grippal symptoms. Headache (supra-orbital or suboccipital), malaise, asthenia, lassitude, gooseflesh, pains in the back and in the ligaments of the neck and in the back muscles indicate some type of toxemia. This has been associated with a cold in the head, or a mild laryngitis or tracheitis, or with a frank influenza. At times severe symptoms have followed those of the so-called influenza by a few days or even a few weeks. In other instances there has been no indication of anything like influenza, and in some areas where the syndrome has been especially well developed there has been no trace of any influenza.

V. Economo<sup>1</sup> has taken great pains to try to show that what he has distinguished as lethargic encephalitis should be sharply separated from influenzal encephalitis, a subject to which we shall refer later in this discussion. In the study here cited he states that in

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<sup>1</sup>v. ECONOMO: Grippe-Encephalitis und Encephalitis lethargica, *Wien. klin. Wchnschr.*, 1919, No. 15.



spite of the fact that there were hundreds and thousands of "grippe" cases in Vienna in 1918-1919, there "was not a single case" of the encephalitis lethargica syndrome. The last Austrian case, he says, occurred in Innsbruck in 1917. Since then, up to comparatively recent times, no encephalitis cases have been observed. According to the Vienna correspondent to the *Journal of the American Medical Association*, February 24, 1920, v. Economo's position is not in agreement with that of others, for at present a wave of influenza [grip] is raging in Vienna, which is not quite as bad as last year's epidemic, and is distinctly different in its clinical manifestations. A new feature of the disease, besides the well-known complications of the lungs and the brain, is a spasmodic condition of the intestines, as reported by Dr. Massery in a paper read recently before the Medical Society of Vienna. He has seen 6 patients in the Samaritan Hospital who, when first seen, showed a condition most closely resembling acute strangulation of the intestine, as manifested by severe pains all over the abdomen, spasms, and continual and absolute constipation. The pulse and temperature, however, remained not far from normal. Operation proved that the occlusion was due not to an obstacle but to severe spasms of the intestinal muscles. In 2 cases the patients could not be saved; death was probably due to the spasmophilic condition so often observed in cases of grip.

Another group of cases showed, as complications, another type of spasms: these resembled chorea. Spasms occurred in different groups of muscles, in the flexors or extensors of the limbs, or of the abdominal walls. The patients were delirious, the temperature rose to 40° C. (104° F.) and higher, and severe somnolence was always present. Seventy-one cases, of which 31 were fatal, were reported by Dr. Dimitz from the neurologic clinic, at the above-mentioned meeting. The postmortem findings showed only a more or less marked hyperemia, and sometimes edema of the brain, chiefly in the lenticular region. Similar epidemics appeared in various towns of Austria, lasting six weeks altogether. Lethargic meningitis, also, is now often observed. The patients are usually young or middle-aged persons [from twelve to fifty years]; the mortality rate is rather high—20 per cent—as causal treatment has not yet been possible. Pneumococcus serum seems to have a beneficial influence.

A peculiar variant, so far as incidence is concerned, has been

described by v. Economo, namely the "recurring or subchronic type"<sup>2</sup>.

The general condition may be ushered in by other somatic disturbances<sup>3</sup>. In 5 out of 41 cases reported by Albertoni, *herpes labialis* occurred; *vesicular pustular eruptions* have occurred in others.<sup>4</sup> Slight *facial cyanosis* was quite frequent.

*Temperature* changes have varied greatly. As a rule there has been slight rise in temperature, from 1 to 2°, from the beginning, persisting from one to four weeks. In some patients, it appears only a week or more after the onset. Marked pyrexia has been occasionally observed, especially with excited and psychotic syndromes. Some subnormal temperature states are recorded.<sup>5</sup>

Epistaxis has been observed in a few cases; bronchitic congestion is frequent and coughing common. The respiratory rhythm is rarely involved, save in those grave cases in which Cheyne-Stokes' respiration develops from central implications. The pulse-rate varies considerably. It is frequently slightly accelerated, and usually disproportionately rapid in comparison with the rise in temperature, but bradycardia is by no means rare.<sup>6</sup> The blood-pressure is not seriously involved, save in some cases in which marked adrenal exhaustion shows low blood-pressures and Sergeant's white line.<sup>7</sup>

The tongue is apt to be dry, coated, and fetid in somnolent states, and also in many cases with mild general symptoms. Dreyfuss<sup>8</sup> calls especial attention to this, believing that the thick, dry, coated, almost burned condition of the tongue is centrally induced.

<sup>2</sup>V. ECONOMO: Ein Fall von chronischer schubweise verlaufender Encephalitis lethargica. *Munchen. med. Wchnschr.*, 1919, No. 46, pp. 1311, 1313.  
 ————Encephalitis lethargica subchronica. *Wien. Arch. f. inn. Med.* 1920, No. 3.

<sup>3</sup>ALBERTONI, P.: Relazione clinica sulla cosi detta encefalite letargica. *Ann. dela clin. med. di Bologna*, 1920.  
 ————Report to the Medical Society, Jan. 22, 1920 (Reprint by courtesy PROF. ALBERTONI).

<sup>4</sup>HOUSE: *Jour. Am. Med. Assn.*, Feb. 7, 1920, 74.  
 CLIMENKO: *loc. cit.*

<sup>5</sup>ALBERTONI: *loc. cit.*  
 DREYFUSS: *Munchen. med. Wchnschr.*, May 7, 1920.

<sup>6</sup>JELLIFFE: *loc. cit.*  
 ALBERTONI: *loc. cit.*  
 CLIMENKO: *loc. cit.*

<sup>7</sup>JELLIFFE: *loc. cit.*  
 DREYFUSS: *loc. cit.*

<sup>8</sup>DREYFUSS: *Munchen. med. Wchnschr.*, May 7, 1920, No. 19, p. 538.

There is nausea, and loss of appetite. Meteorism is frequent, and a number of anomalous vegetative signs have been recorded, among them pseudo-appendicitis. Netter<sup>9</sup> has recorded excessive salivation in one case.

The renal functions are initially involved. Traces of albumin are frequent and the general impairment of capacity is related to the toxic state in general.<sup>10</sup>

Azoturia, azotemia, oliguria have been recorded.<sup>11</sup> Weakness of the bladder may occur early or at any time during the illness.

*Blood.*—There is apparently little that is diagnostic in the blood formula.<sup>12</sup> Slight leukocytosis is usually present.<sup>13</sup> Counts as high as 22,000, 24,000<sup>14</sup> are recorded. There is frequently a slight relative and absolute increase in the polymorphonuclear neutrophil elements.<sup>15</sup>

Skversky reports eosinophilia in some of his cases seen among the A. E. F. in France.

*Cerebrospinal Fluid.*—In the earliest reports of v. Economo, Netter and Claisse, it was stated that there were no appreciable changes in the cerebrospinal fluid, but soon positive findings began to mount up. Ardin-Delteil, Achard, Widal (200) soon reported pronounced increase in the number of cells—findings which have been more or less uniformly confirmed since.

More or less constant increase in the cell-counts is reported by the later findings of Dreyfuss, Barber, Cross and Irwin and others. The former observer has found a uniform increase; from 10 to 20 cells are common<sup>16</sup> and cell-counts of from 136 to 251 per cu. mm. have been observed. The latter observers report cell-counts of small

<sup>9</sup>NETTER: *loc. cit.*

<sup>10</sup>BARKER, CROSS AND IRWIN: *loc. cit.*  
ALBERTONI: *loc. cit.*

<sup>11</sup>MAY, E.: *Bull. et mem. Soc. med. d. hop.*, July 26, 1918, p. 888.

<sup>12</sup>DREYFUSS: *loc. cit.*

<sup>13</sup>BARKER, CROSS, IRWIN: *loc. cit.*

<sup>14</sup>ALBERTONI: *loc. cit.*

<sup>15</sup>BARKER, CROSS, IRWIN: *loc. cit.*

<sup>16</sup>BETTI, E.: *L'Ospedale maggiore*. vii, No. 12, p. 205.  
SKVERSKY: *loc. cit.*  
CLIMENKO: *loc. cit., et al.*



mononuclear cells of from 10 to 100, with a positive globulin reaction and negative Wassermann, negative smears and negative bacteriological findings. Dreyfuss finds large and small mononuclear cells in about equal proportions, and the gold sol tests are quite characteristic in that the curve ranges midway between a luetic curve and a meningitic curve.

Bloody fluid has sometimes been encountered. This finding must be carefully investigated, since faulty technic may account for its presence, but there are enough observations to show that the hemorrhagic features of an encephalitis may be found in the cerebrospinal fluid.<sup>17</sup>

In one personally observed case the presence of blood in the puncture was highly important in estimating whether the patient had encephalitis lethargica or a fracture of the base of the skull, there having been a history of dizziness and a fall at the inception of the disturbance.

X-rays of the skull were negative, and the subsequent history seemed to bear out the diagnosis of encephalitis lethargica.

More or less extensive hemorrhages into the ventricles in cases of influenzal encephalitis have been known since the studies on the epidemic of 1890, and more recently Hansteen has reported similar findings.<sup>18</sup>

The Wassermann reaction is negative. In certain cases with clinical signs closely resembling lethargic encephalitis, which show a positive Wassermann reaction, the diagnosis of syphilitic encephalitis should be made, and specific treatment inaugurated.

P. Marie has emphasized the necessity of an examination of the Wassermann reaction. During the present epidemic of lethargic encephalitis 3 cases were found, under observation by the author, to be syphilitic in which the first diagnosis was of so-called "lethargic encephalitis."

The incidence does not seem to be affected by the sex of the individuals.

The age limit has been found to be from eleven months to seventy years.

*(To be continued)*

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<sup>17</sup>BARBER, CROSS, IRWIN, ABRAHAMSON, CLIMENKO, JELLIFFE, *et al.*

<sup>18</sup>HANSTEEN: *Norsk. Mag. f. Laeg.*, Feb., 1920.

FELL, E. W.: The Early Diagnosis of General Paralysis of the Insane. *Southern Medical Journal*, March, 1920, xiii, 184.

The author points out:

(1) The early diagnosis of paresis is not as important from a therapeutic standpoint as it is from the standpoint of protecting the patient and his family from his irresponsible acts.

(2) A change in disposition or habits in a middle-aged male, who has not previously had a psychosis, should always arouse a suspicion of paresis.

(3) A diagnosis of paresis is possible even in the early stage by taking into consideration the mental, neurological and serological findings.

(4) A diagnosis of paresis on the basis of mental symptoms alone is uncertain.

(5) A diagnosis on the basis of physical and mental symptoms has a definite margin of error.

(6) The positive spinal fluid (and blood serum—Abstr.) Wassermann in a mental case is the most reliable sign of paresis. The spinal fluid findings in paresis consist in an increase in the number of white-cells (above 7 per cu. mm.), a positive globulin content as shown by the Noguchi or Ross Jones tests, and a positive complement-fixation. The two former are present in about 95 per cent of paretics; they also occur in other organic conditions, where differentiation is necessary, but the positive Wassermann is found in all paretic fluids and is not found in non-syphilitic psychoses. The gold curve, although of value in a confirmatory way, may give a paretic reaction in cases which are not only non-psychotic but also non-luetic. A positive spinal fluid Wassermann, in a mental case, is by far the most reliable index of paresis, the only conditions requiring differentiation being the relatively infrequent psychoses met with in other forms of cerebrospinal lues.

M. KESCHNER.

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## SECTION ON GENERAL MEDICINE

ADAMS, R. D.: Hookworm and Manifest Tuberculosis. *Southern Medical Journal*, Feb., 1920, xiii, 105.

According to Adams, while hookworm disease and tuberculosis are often referred to in medical literature as being related, and although it is frequently inferred that the relationship is one of cause and effect, no serious studies have been made to place this relationship on more than a speculative basis.

From evidence at hand, it seems that manifest tuberculosis is more frequent among individuals harboring hookworm than among those who are free from hookworm but are under similar hygienic conditions.

A generally lowered resistance incidental to hookworm disease, as evidenced by anemia and malnutrition, is credited with being the essential factor in producing lapse of immunity to tuberculosis.

There is no evidence establishing any specific relationship between the two diseases.

Inasmuch as it has been shown that the death rate from tuberculosis may be reduced by a measure so simple as the elimination of hookworm where double infection exists, the obligation of the medical profession with regard to diagnosis and therapy becomes self-evident.

In 46 cases of suspected tuberculosis the author found no evidence justifying the diagnosis of tuberculosis, but established the presence of uncinariasis (hookworm) in 32 cases. The remaining 14 cases gave definite histories of previous infections of varying

severity. The provisional diagnosis had been made in each case from the adventitious sounds heard in the upper part of the chest. Further study of these cases elicited the entire absence of râles and the presence of joint sounds varying from fine crepitation to coarse grating. It was not so easy to differentiate these from true râles.

A comparative study of 100 subjects with clinical symptoms of hookworm disease, and of 100 normal subjects, showed a preponderance of confusing crepitations in the ratio of about three to one in favor of the former. Most of these crepitations are best heard over the sternocostal junctions, and are transmitted to the ribs, especially near the clavicle. In cases of uncinariasis of long standing the adventitious joint sounds are not limited to the shoulder-girdle and the neighboring parts, but can be heard over several or many of the other joints.

M. KESCHNER.

CROFTON, W. M.: The Next Stage in the Tuberculosis Movement. A Criticism and a Suggestion. *British Journal of Tuberculosis*, Jan., 1920, xiv, No. 1, p. 19.

An accurate diagnosis can be made by the subcutaneous injection of a reliable tubercle antigen. The occurrence of a general reaction after such an agent indicates, with but few exceptions, active tuberculous disease. If there is a reaction in a suspected focus, the diagnosis is absolute. The antigen used is benzoyl chlorid solution, which is considered to be perfectly reliable and harmless in the doses prescribed, viz, 0.0000001 mg., 0.000001 mg., 0.00001 mg., 0.0001 mg. It is seldom that no reaction is obtained after the second dose, if the disease is active.

This method is especially desirable in the case of contacts, for example, for members of a family in which a case of tuberculosis has occurred. These members have often a low resistance and have been exposed to a virulent infection.

The author thinks that all patients in whose sputa tubercle bacilli are to be found are suffering from a mixed infection with catarrh-producing microbes, and that this secondary infection must be dealt with by suitable autogenous antigens. Failure to do this is the most common cause of the failure of tuberculin in treatment.



Crofton also advocates the use of intravital germicides, such as iodoform in ether, or di-iodosalicylic acid, given intravenously. Statistics are given from the National Hospital for Consumption in Ireland to show the results obtained since the iodoform-catarrh antigen-tuberculin method came largely into use, and these show an increase of 15 per cent in the number of apparently cured cases over the number of cases cured by the ordinary sanatorium method.

C. F. NICHOLS.

SILVESTRI, T.: Appendicitis and Tuberculosis (Appendicite e tubercolosi). *Le Riforma medica*, Naples, Jan. 10, 1920, p. 43.

The author thinks that appendicitis of a tuberculous nature is frequent enough to be worth taking into consideration. He publishes his private statistics in which, out of 103 cases, 47 (45.64 per cent) had tuberculous manifestations sooner or later. He insists upon the necessity of paying greater attention to this concomitancy. It is essential to decide whether the tuberculous appendicitis is to be considered as a definite pathologic entity or only as a sequela of pulmonary tuberculosis. From the literature on the subject he concludes the following:

(1) Tuberculosis seems to have a predilection for the lower part of the intestine, "and it can be found especially as a localized lesion in the cecum and in the appendix. In the latter it occurs in the form of common appendicitis and in the former it gives the signs of a malign tumor" (Durante).

(2) Although it is possible that such a tuberculous lesion may be secondary, the primary tuberculous infection of the appendix is not so infrequent as it is generally thought to be.

(3) In pulmonary tuberculosis, appendicitis is rather frequent. Some authors think that it occurs in as much as from 20 per cent to 28 per cent of cases.

(4) It is true that in such cases appendicitis seldom becomes a serious complication.

(5) Tuberculosis of the appendix may remain latent for a long while, giving occasional signs of common, acute or chronic appendicitis. The diagnosis is difficult when no lung signs can be found. A

careful differential diagnosis will give the cue. The most distinct signs of tuberculosis of the appendix are a marked distention of the abdomen after the acute symptoms have subsided, and ascites. Usually the diagnosis can be made only after the patient has been operated on, or at autopsy.

(6) It occurs not infrequently that an appendicular syndrome is the expression of a peritoneal tuberculosis, and when operation for appendicitis is performed it must be kept in mind that a tuberculous lesion of the appendix may be the cause of a generalized tuberculosis of the peritoneum.

C. F. ARROYO.

BRAASCH, W. F.: Surgical Renal Tuberculosis. The Prognosis. *The American Journal of the Medical Sciences*, Jan., 1920, clx, Part 1, No. 574, p. 8

The surgical records of 532 patients operated on for renal tuberculosis at the Mayo Clinic between 1894 and 1918 are reviewed. Surgical renal tuberculosis occurred in 0.6 per cent of all operative cases. It occurred most frequently between the ages of 20 and 40 (70 per cent), and twice as often in males as in females. The postoperative mortality in male patients was somewhat higher than that in females. It was usually not surgical in children, and was often a manifestation of general tuberculosis. Evidence of tuberculosis in other tissues of the body may be found in fully 71 per cent of all patients, if not in all. The postoperative mortality among patients with coincident lesions is usually not higher than that of the general average. Multiple lesions, unless they are a part of an acute general infection, do not necessarily render the prognosis more unfavorable. Evidence of healed pulmonary tuberculosis was present in one-third of these patients. The percentage of recovery among patients with healed pulmonary tuberculosis was above the average and may be considered indicative of good powers of resistance. Coincident active pulmonary tuberculosis was found in about 5 per cent of the patients, of whom more than 60 per cent recovered following nephrectomy. Involvement of the genitalia was present in at least 73 per cent of male patients and did not seem to affect the ultimate recovery. Frequency of spontaneous healing of lesions in

the prostrate and seminal vesicles contra-indicates their removal by subsequent operation. In 6 per cent of the cases evidence of bone and joint tuberculosis was noted. Half of these were active cases. Spondylitis usually healed, being present in 5.7 per cent. The rate of mortality was 12 per cent. Chronic spondylitis does not influence the prognosis. Active spondylitis does not offer a favorable prognosis, although it does not contra-indicate nephrectomy. Tuberculous adenitis was present in 19 patients (3.6 per cent). With a low mortality (10 per cent) this is suggestive of heightened resistance. Low hemoglobin does not affect the prognosis. Marked bladder involvement increases the mortality, the involvement depending on the virulence of the infection. The mortality percentage is markedly influenced by the degree of pathological involvement of the kidney, increasing in proportion to the extent of the lesion. Early lesions have the lowest mortality, and pyonephrosis, the highest. The duration of preoperative symptoms does not materially affect the late mortality. Occluded renal tuberculosis is indicative of relative immunity and a low mortality. Recovery or permanent improvement of the remaining kidney will not follow after one kidney has been removed in cases of bilateral renal tuberculosis. Late mortality is by far highest during the first year; it decreases with the length of time elapsing after operation. The late mortality is approximately 20 per cent, and failure to effect a complete cure, approximately 20 per cent. This leaves a prognosis of recovery of 80 per cent, while complete cure may be expected in fully 60 per cent of patients.

A. T. MAYS.

BONET, B.: Renal Tuberculosis and Its Treatment. *Los Progresos de la clinica*, Oct., 1919, vii, No. 82. Reported in *La Presse médicale*, Apr. 24, 1920, xxvii, No. 25, pp. 251-252.

The author emphasizes the importance of an early diagnosis, not only an establishment of the existence of a renal tuberculosis, but also the determination as to whether it is unilateral or bilateral. For this purpose, besides a careful clinical examination, the author examines the urine for pus, acidity and tubercle bacilli, and does a cystoscopy and a ureteral catheterization. A blood chemistry test should also be done, and the urine nitrogen partition determined.



. Bonet usually does a nephrectomy when the condition is unilateral, or when the lesion of the opposite kidney is very slight. Renal tuberculosis is frequently unilateral, and in such cases the author does not usually spend much time on medical treatment. He does not deny the possibility of a spontaneous cure, but believes such an occurrence to be very rare.

Nephrectomy is the operation of choice. Nephrotomy is done only when the lesions are bilateral, when there is a painful pyonephrosis with fever, and when the condition of the bladder prevents careful study of each kidney separately.

Medical and surgical treatment should always go hand in hand. When surgical intervention is impossible, or after a nephrectomy, the remaining kidney is markedly benefited by other treatment. Medical treatment consists in general hygienic care, heliotherapy, tuberculin therapy and the "altitude cure".

S. KAHN.

DINNAN, J. B.: Concerning Heliotherapy in Tuberculosis. *Medical Record*, Jan. 10, 1920, xevii, 62.

Four years ago, when Dinnan read that Rollier claimed to have cured not only surgical but also pulmonary tuberculosis by his methods of using heliotherapy, he started a heliotherapy clinic with some of the consumptives under his care at the Meriden Sanatorium, closely following Rollier's technic.

His class consisted of 6 male patients ranging from fifteen to fifty-four years of age. The cases were all active, advanced or in the second stage; tubercle bacilli were found in all sputa. Dinnan began the experiment early in June and continued it until the end of October. It was conducted on the roof of one of the second story verandas. He followed the *gradual exposure* method of Rollier. To 2 patients the treatment was administered a little too intensively at the beginning, as a result of which they sustained two severe sunburns; these soon healed, and in ten days these 2 patients had caught up with their classmates. The patients experienced very little discomfort. They were exposed while lying on cots, placed on the veranda roof, the amount of body surface exposed being controlled by the use of a light covering. Each patient had on a

pair of light cotton drawers, a white hat and a pair of smoked glasses. The treatment was continued for five and one-half months, but exposures were made only on one hundred and seven days, on account of the many days of rain, which necessitated a discontinuance of treatment for those days. The daily temperature varied between 40° F. (4.44°C.) and 90° F. (32.22° C).

At the beginning of the treatment, blood-pressure determinations with blood-counts and hemoglobin estimates were made every few days, and later every week. The patients were weighed weekly, while the temperature, pulse and respirations were taken daily at the beginning and termination of each exposure.

At the beginning of the treatment, roentgenographic plates were obtained in each case. Frequent notes were made as to cough, sputum, appetite, sleep, and bowels. Several sputum examinations were also made during this period.

Of the 6 patients, 2 died; in 3 cases the disease has been arrested, so that the patients have resumed their work; the sixth patient left the sanatorium with the infection arrested, and returned to work, but the author has not been able to trace him for the last two years. Of the 2 who died, 1 left the institution improved and died eighteen months later of a severe hemorrhage; the other died at his home. He had a greatly hypertrophied heart, but it was undoubtedly tuberculosis which caused his death. In these 6 cases, the treatment diminished the amount of sputum in all cases; it markedly improved the cough in 5 cases, and the temperature in 2 cases; it slowed the pulse-rate in 4 cases, browned the skin in all cases at first, except in the 2 in which death occurred later. The skin paled in patches after thirty days and never again darkened; in all cases the sleep and appetite became better; the patients all said they felt better; 4 lost weight (on an average two and three-quarter pounds) 2 gained weight (on an average seven and one-half pounds); 2 of those who lost weight were among the arrested cases.

A study of the records of the blood-pressure, red and white blood-counts, and hemoglobin estimations, showed no apparent relation between these results and a gain or loss in the general or pulmonary condition.

In conclusion, the author states that sunlight properly applied is our best therapeutic agent in the treatment of osseous and glandular tuberculosis. Although its application has been most success-

ful when it is applied to patients who are living at high mountain altitudes or on the ocean beaches, it also gives very excellent results in the case of patients who are located at inland places or even on the lowlands.

M. KESCHNER.

COLEMAN, W.: Asynchronism of the Respiratory Movements in Lobar Pneumonia. *Journal of the American Medical Association*, Dec. 27, 1919, lxxiii, No. 26.

This condition is characterized by an alteration in the normal respiratory cycle, whereby the diaphragm contracts, the abdominal muscles are forced outward, and then, after a perceptible period, the intercostal muscles contract, completing the cycle. In the normal respiratory act these various contractions are practically synchronous. Coleman calls attention to this sign, which he describes in its fully developed state as an alternate rise and fall of the chest and abdomen, and to which he applies the term see-saw. His experience is that it appears only in lobar pneumonia, although other writers have mentioned a slight degree as being perceptible in meningitis, typhus fever, uremia, heart-disease, and other forms of pneumonia, and cerebral disease. His article discusses the probable mechanism, which he summarizes as probably due to unequal depression of different parts of the central nervous respiratory mechanism. He regards it as a sign indicating a fatal termination.

H. G. WEBSTER.

MEYER, J.: The Clinical Picture of Influenza-pneumonia and its Complications. *International Clinics*, 1919, 29th series, iii, 112.

From his experience with pneumonia during the epidemic of influenza of 1918, at Camp Zachary Taylor, Kentucky, the author draws the following conclusions:

(1) The past (1918) epidemic of influenza-pneumonia presented a clinical picture which at first indicated the presence of a primary infection of the upper respiratory tract.



cording to the progress of the case. The antitoxin may also be repeated. In this manner the bacilli are destroyed and the toxin neutralized.

*The Advantages of the Method.*—The production of the toxin is stopped; from the time the vaccine is administered the patient produces his own antitoxin. The toxins already formed are rendered inert by the doses of antitoxin administered, thus preventing diphtheritic paralysis and cardiac failure.

It prevents carriers, by destroying bacilli in the throat, thus stopping epidemics. It may also be employed in the immunization of exposed individuals, who are frequently carriers and keep up the epidemic.

In infected cases it rids the throat of bacilli in ten days, shortening the quarantine period of the disease.

It is therefore cheaper than antitoxin; it prevents the loss of time and money on the part of our public school system, and of the municipal health departments.

M. KESCHNER.

FUNK, E. H.: Pulmonary Syphilis. *American Review of Tuberculosis*, Feb., 1920, iii, No. 12, p. 754.

We may be reasonably certain that authentic causes of syphilis of the lung occurred and were recognized before we knew of the treponema and the Wassermann reaction. Many of the diagnoses were made by exclusion and the therapeutic test. The author cites a case reported by Hughes and Wilson in the Philadelphia Hospital in which the diagnosis narrowed down to malignant disease, tuberculosis and syphilis. The prompt and almost complete recovery under administrations of potassium iodid ruled out the first and excluded tuberculosis which, although sometimes stationary under the influence of the iodids, is usually aggravated, and is never benefited by the drug. The Wassermann test occurs positively in so many cases, with and without respiratory symptoms, that it often has no direct significance. In the secondary stage bronchitis of varying severity is not uncommon. This is in keeping with the general tendency to mucous membrane involvement in this stage. The lesion is usually transient. It is important, however, to recognize that in

a certain group of these patients there is an associated apical catarrh giving rise to fine crackling râles which may be interpreted as tuberculous. The differentiation may be difficult, as the two diseases are not infrequently associated, or a superimposed syphilis activates an old lesion. It may be necessary to suspend judgment until treatment for lues has brought the condition under control, when the apical râles will clear if the symptoms are due to lues. We are particularly interested in late syphilis of the lung. It most commonly manifests itself as gummata, which may occur anywhere in the lung, but are usually found near the root or in the lower lobes. These may occasionally break down and form small cavities. They rarely form large cavities as in tuberculosis, and they are rarely found clinically. The gummata may be formed into fibrous tissue, and the resulting contraction and puckering may distort the lung and give rise to considerable bronchiectasis. The gummata of the lung may be latent. Syphilis of the lung may manifest itself as a diffuse fibrosis. The fibrous lesions of this character, referred to syphilis, do not present any cardinal characteristics and cannot be distinguished during life from fibrosis due to tuberculosis and other causes. Of 2,500 autopsies at John Hopkins Hospital, lung lesions which were believed to be syphilitic were present in 12 cases. The following points should be kept in mind.

- (1) The history must be obtained, i. e., the absence of contact with a tuberculous member of the family or with others.
- (2) The presence of concomitant signs of lues in other organs must be noted.
- (3) Tuberculosis is a disease which at first involves the apices of the lungs and spreads therefrom. Lues, on the other hand, usually involves the hilum areas and the bases; the location of such a lesion strongly suggests the presence of a non-tuberculous condition, as, for instance, lues.
- (4) Patients with advanced tuberculosis, and those with persisting purulent sputum due to tuberculosis, practically always have bacilli in their sputa. Conversely, whenever the sputum of a patient with symptoms and signs of advanced disease is repeatedly negative for tubercle bacilli, it is wise to consider the possibility of some other disease, for instance, of syphilis.

- (5) The Wassermann test must be carefully weighed. A positive Wassermann reaction does not mean that a pulmonary lesion is necessarily syphilitic. The two infections may co-exist. The Wassermann reaction assumes diagnostic importance in regard to the pulmonary lesion when all the tests for tuberculosis are negative.
- (6) X-ray diagnosis is of value. Watkins states that the belief that lung syphilis is rare is based on a misconception, namely, that it always occurs as a large or small gumma. He holds that if we adhere to Virchow's teaching that the disease occurs as an interstitial pneumonitis, we will recognize it more frequently. Watkins classifies the shadows as follows:
- (A) *Syphilitic consolidation* in which the roentgenogram presents a massive shadow involving an entire lobe, or a large portion of the lobe contiguous to the mediastinum, diminishing in density toward the periphery.
  - (B) *Early diffuse sclerosis* in which the roentgenogram shows an evenly distributed radiating linear marking, or a diffuse speckling throughout the lung, sometimes bilateral.
  - (C) *Dense sclerosis* in which the roentgenogram has a characteristic pyramidal-shaped shadow, with the base toward the hilum, and with a lance-like projection into the lung substance. This shadow is looked for in the lower or middle lobe, and not in the apex or upper lobe, as in tuberculosis.
- (7) The response to antisyphilitic treatment must be noted.

C. A. SCHMID.

HUTINEL, V., AND STEVENIN, H.: Hereditary Syphilis and the Dys-trophies. *Archives de médecine des enfants*, Paris, March, 1920, xxiii, No. 3, p. 145. (Abstract of first part of article on page 319).

This is the third article in which the authors have laid emphasis upon the frequency of hereditary syphilis as the fundamental basis in various nutritional and developmental disturbances. The tre-

ponema often attacks one or more of the endocrine glands. Conditions may then result which can be attributed to endocrine deficiency or hyperplasia. In the case of children under the age of ten years thyroid disturbance is the most frequent factor, although other glandular disturbances may also be responsible to a greater or smaller degree. The symptoms range from slight mental and physical retardation to typical cretinism and Basedow's disease. The usual features are the small size of the patient, his moon-like face, apathy, and lack of intelligence.

Two cases are quoted to illustrate the beneficial effects of mercury and thyroid extract. During adolescence dystrophies due to latent luetic lesions of the endocrines are frequent. The majority of the symptoms at this period, although usually pluriglandular, may be attributed mainly to disturbances of the hypophysis. The patients are weak, non-resistant to infections, especially tuberculosis, and are too tall or too fat. True acromegaly and gigantism are infrequent, but their taints are numerous. Headache, eye trouble, cyanosis, arrhythmia, orthostatic albuminuria, polyuria, diabetes insipidus, late rickets, chronic rheumatism and the adiposogenital syndrome are frequently noted. Dystrophies may also be due to the effects of hereditary syphilis on the testicles, ovaries, suprarenals, thymus and pancreas. Two case reports illustrate the therapeutic value of novarsenobenzol, mercury, and of powdered thyroid, hypophysis, and suprarenal. In all unexplained blood conditions, such as anemia, pseudoleukemia, von Jacksch's anemia and true leukemia, hereditary syphilis should be considered as a possible etiological factor.

*(To be continued)*

W. C. DAVISON.

BARBE, A., AND GLENARD, R.: Convulsive Crises of Pleuropulmonary Origin (*Les crises convulsives d'origine pleuropulmonaire*) *Le Progrès médical*, Jan. 11, 1920, xxxv, No. 2, p. 13.

The authors give the histories of 5 cases with the purpose of showing the relations existing between epilepsy and pleural lesions. All the cases recalled by the authors had epileptiform attacks after some respiratory troubles, such as pleural pneumonia, bronchopneu-



monia and pleurisy. They attribute the cause of the epileptiform convulsions to the respiratory lesions, depending upon the age of the patients, all of whom were adults without any previous history of epilepsy.

The convulsions were more frequent and intense when the respiratory lesions were marked. The side on which the convulsion appeared corresponded to the side on which the respiratory lesion was situated. The authors admit a reflex action provoked by a peripheral irritation, similar to the phenomena occurring in convulsive crises observed in children suffering from worms.

C. F. ARROYO.

RAMOND, M. L.: A Case of Gastric Syphilis—(A propos d' un cas de syphilis de l'estomac). *Le Progrès médical*, Jan. 4, 1920, xxxvii, No. 1, p. 7.

The author presents a case which he considers well worth discussing. A woman forty-six years of age fell suddenly ill while walking through the streets, almost losing consciousness, and vomiting a great amount of bright blood. A physician who visited her soon afterward diagnosed the condition as gastric ulcer and prescribed accordingly. Some days afterward she was admitted to the hospital, where the author saw her for the first time. She told him that she had had two similar attacks. The first attack dated back fourteen years. All the attacks happened without pain or gastric distress of any kind. She recovered soon after each attack. When examined the patient showed a marked pallor, denoting a deep anemia. The hemoglobin content was 50 per cent. The abdomen did not show anything abnormal, and the patient's appetite was good. There was nausea, no vomiting and no pain. Although the bowels were regular, the stools were black in color, resembling those in melena. Five days after the accident, the gastric hemorrhage continued, which explains the anemia. All organs were normal and the temperature was about 37° C. (98.6° F.). The urine and reflexes were normal. There was no Argyle-Robertson, nor any condition to suggest syphilis except on the skin, where the author discovered characteristic lesions of whitish round scars, some of them resembling keloids. These were found to be the remainder of an

ulcerative rash which had appeared six years before, and which was cured by one injection only of an insoluble salt of mercury, after five years of unsuccessful dermatological treatments. The patient stated that she had had a vulvar chancre, followed by secondary symptoms, when she was twenty-one years of age. Based on the above data the author builds a pathogenic theory, explaining the gastric hemorrhage, and diagnoses the case as one of syphilitic gastric ulcer. The patient's condition improved after antisiphilitic treatment. The author compares his case with cases similar to this, described by de Dieulafoy and M. Fournier. He insists upon the importance of looking for syphilis in any case of gastric hemorrhage with obscure pathogenesis.

C. F. ARROYO.

STERN, M., AND RITTER, J. S.: A New Method of Treating Remote Manifestations of Gonorrheal Infections. *Medical Record*, Jan. 31, 1920, xcvi, 190.

In July, 1919, the attention of the authors was called to the treatment of gonorrheal arthritis by means of a nonspecific protein. Up to this date, they had treated all these cases by vaccines, internal medication and local measures. Upon investigating nonspecific protein therapy they found that the *Bacillus typhosus* was used by most of the workers in this field. All reported a reaction following the intravenous injection of the emulsion. The patients were very sick for from twenty-four to forty-eight hours, with severe chills, high fever, and an increased leukocyte count. This reaction was essential in bringing about a relief or cure of the arthritis.

Beginning in July, 1919, all cases of gonorrheal arthritis that came under their observation in the venereal wards of the Broad Street Hospital in New York City, were given intravenously 20 c.c. of a solution of sodium iodid, 2 grams (30.86 grains) to the 20 c.c. This treatment was repeated every four days. The results were so uniformly favorable that they decided to resort to the same treatment in cases of orchitis. The improvement resulting in these cases was so marked that they also began to use these intravenous injections in a series of prostatic infections, with good results.

By thus extending the field of therapeutic application they have now obtained records of 100 cases of remote gonorrheal infections discharged as germ-free and apparently cured. They admit, however, that all the usual therapeutic measures were employed in conjunction with the intravenous administration.

In contrast to patients treated with nonspecific proteins, those treated intravenously with sodium iodid showed no noticeable rise in temperature; they were allowed to be up and about immediately following the injection. There was no change in the blood-pressure and in the renal functioning, nor were there leukocytosis, chills or general malaise. This feature is important, inasmuch as it renders office treatment of these patients possible without any dangers.

M. KESCHNER.

ROHLEDER: Organotherapy in Hypertrophy and Atrophy of the Prostate. (Organotherapie des Prostatismus Prostatatrophie und Atrophie). *Deutsche medizinische Wochenschrift*, Jan. 15, 1920, xlv, No. 3, p. 70.

*Atrophy* and absence of *hypertrophy* of the prostate, according to Rohleder, is characteristic of old age. Clinically, however, it does not make much difference whether the gland is hypertrophied or atrophied, inasmuch as the symptoms are about the same. The course of the disease may be divided into three stages: (1) acute urinary retention; (2) chronic (partial or total) urinary retention with constant residual urine in the bladder, a gradually poorer stream and tenesmus after micturition; and (3) incontinence, with the gradual development of insufficiency of the urinary organs, necessity of catheterization, eventually followed by cystitis and painful micturition. When the prostate is found by rectal palpation to be undersized rather than enlarged, the condition is not called "prostate hypertrophy" but "prostatismus".

There is, according to Rohleder, abundant experimental and clinical evidence to show that testicular secretion—the testicular hormone—exerts an important influence upon the glandular structure of the prostate. With this aspect of the subject in mind, he has employed testogan, and hormospermin in dosage of 1 tablet t.i.d. after

meals up to 40 tablets in the "prostatismus" syndrome. The former contains the extracts of testicle, prostate, seminal vesicles, thyroid, adrenals, and hypophysis combined with yohimbin; the latter contains all the above mentioned extracts without yohimbin. He could see no difference in the therapeutic effects between testogan and hormospermin; i. e. the results were the same with or without yohimbin.

He sums up his results by saying that they were favorable in the first stage, palliative in the second, and worthless in the third.

M. KESCHNER.

RODET, A., AND BONNAMOUR, S.: Serotherapy in Typhoid Fever.  
*La Presse médicale*, Jan. 31, 1920, xxviii, No. 9, pp. 81-85.

The serum which the authors have used is of very great value in lowering the temperature and in decreasing the general toxemia. It acts best if applied before the eleventh day of the disease, but gives favorable results in all stages of the disease. There is no danger in administering the serum, and there are no contra-indications to its use. Given often enough, it prevents complications, lowers the mortality, and shortens the duration of the disease.

The first injection of 20 c.c. (5.42 fluidrams) of serum is given as soon as the diagnosis of typhoid fever has been clinically established. The injections are given subcutaneously, in the abdominal wall, with the general aseptic technic. If within 2 days the fever has not fallen, the second injection is given. A third, fourth or fifth injection may be given at forty-eight hour intervals, if necessary.

M. KAHN.

UNGER, L.: Typhoid and Paratyphoid in Vaccinated Troops.  
*Illinois Medical Journal*, Feb., 1920, xxxvii, 101.

Unger bases this paper on a series of 25 cases of fever which were under his care while he was attached to the Evacuation Hospital, No. 2, at Coblenz, Germany, in the Army of Occupation.



All the patients were admitted between December 18, 1918, and February 10, 1919, and were all enlisted men of the Army of Occupation. Inasmuch as they had all received at least one course of inoculation against typhoid and paratyphoid during their army careers, the diagnosis was not always easy. It is well known that such inoculation tends to change the clinical picture of the typhoid group of fevers, should they subsequently occur.

In accordance with the instructions given by Lt.-Col. Homer F. Swift, the consulting physician of the Third Army, the typhoid group was subdivided into the following classifications:

(1) Typhoid (bacteriological), where *Bacillus typhosus* was isolated either in the blood or feces.

(2) Typhoid (necrological), where the diagnosis was made or corroborated postmortem.

(3) Typhoid (clinical), including cases in which the symptoms pointed to the disease, but the germ could not be isolated.

(4) Observation typhoid, including suspicious cases in which the germs could not be found and where the symptoms were not sufficiently characteristic to include them in the third group.

(5) Paratyphoid A. or B., in which the paratyphoid bacilli were isolated either in the blood or feces.

Owing to military reasons laboratory methods could not be resorted to in the case of each patient and examinations for the germs in the urine were not made. Every patient, however, had a blood culture made from twenty-four to forty-eight hours after admission, and many were repeated later. Their stools were repeatedly examined and at least one leukocyte count was made in each case.

The fever in most of the cases was not as typical as that seen in civil practice; this was particularly noticeable in two of the paratyphoids. The pulse, in comparison with the temperature, was usually slow. The reason that many more positive cultures were not obtained, Unger thinks, was due to the fact that many patients had been ill a week or longer prior to admission.

From a study of these cases, the author is convinced that anti-typhoid inoculation is only a partial protection. Fifteen of the 25 patients had been inoculated more than a year previously, 10 within a year, and yet they were victims of the disease. Reinoculation, therefore, should be done at least once a year. Unger attrib-

utes the very low mortality (4 per cent), and the lessened severity of the disease, to the previous inoculation. Two patients who had developed pneumonia and later empyema were both doing well when the author left Germany in March. One man who had both intestinal hemorrhages and suppurative parotitis made a good recovery. The only death in the series occurred in 1 of the 2 cases with hemorrhages.

In none of the cases could a history of a previous typhoid infection or of any typhoid or paratyphoid infection among the soldiers or civilians in the neighborhood be obtained.

The treatment carried out was similar to that in civilian hospitals. It was mainly dietetic with symptomatic treatment of the complications.

M. KESCHNER.

Gow, A. E.: Intravenous Protein Therapy. *British Medical Journal*, Feb. 28, 1920, No. 3087, p. 284.

Foreign protein, either bacterial or peptone, is given intravenously with the purpose of causing a "shock" reaction. After the injection of from fifty to one hundred million killed colon or typhoid organisms, a sensation of chilliness is noted in from four to five hours, followed by a definite rigor, and a rise in temperature to 103° or 104° F. (39.45° or 40° C.). In an extreme reaction there may be dyspnea and cyanosis, which is relieved by hypodermic injection of 0.75 c.c. of 1 to 1000 adrenalin, or 1/100 grain of atropin. The pulse frequency is increased during the reaction, and there may be extrasystoles. The systolic blood-pressure falls 20 mm. in a few hours. In the blood there is an immediate fall in the leukocyte count, with a relative increase in the number of lymphatic cells, and then after the rigor, an increase to from 20,000 to 30,000. Myelocytes and nucleated red-cells may be seen at the height of the reaction. If peptone is used, the cycle is very similar, but the pulse frequency must be watched during the injection, and if it exceeds 35 per quarter the injection should be stopped; from 5 to 10 c.c. of a 10 per cent peptone solution will give a shock reaction. Cases of typhoid fever, pyogenic infections both local and general, arthritides, especially the chronic forms with no apparent focus

of infection, psoriasis, and lupus erythematosus, were benefited by this treatment, but it is not looked upon as a panacea. It is to be regarded as an accessory aid, and should not displace the other known remedies for these conditions.

L. C. JOHNSON.

LAHEY, F. H.: Loss of Both Eyes from the Exophthalmos of Hyperthyroidism. *Boston Medical and Surgical Journal*, April 22, 1920, clxxxii, No. 17, p. 427.

The following case is cited as an illustration of the extent to which the exophthalmos of hyperthyroidism may progress.

A patient was admitted to the eye service of Boston City Hospital, October, 1917, with a history of treatment of hyperthyroidism by *x*-rays. In all she received 8 treatments in six months, with the result that her pulse decreased, she gained weight and felt better, but her exophthalmos progressed until the edema and ulceration of the right cornea were such as to necessitate the removal of the right eye. Shortly after that the left eye was edematous and the cornea ulcerated. In order to preserve the eye of that side the sympathetic ganglion on the affected side was removed, but without avail. The edema progressed so that finally the eye was enucleated. This is one of the rare conditions complicating hyperthyroidism. While the *x*-ray treatment had nothing to do with the condition, still the author believes that the surgical removal of a considerable portion of the gland, rather than *x*-ray treatment, is a much better procedure, inasmuch as the relief from hyperthyroidism is more complete and immediate.

M. M. BANOWITCH.

O'HARE, J. P.: Renal Function in Vascular Hypertension. *Boston Medical and Surgical Journal*, April 1, 1920, clxxxii, No. 14, p. 345.

The diagnosis of "vascular hypertension" is appearing with ever-increasing frequency in our hospital records. But the practitioner rarely recognizes this as a distinct entity. He still calls

all cases with high pressure, albumin, and casts "chronic nephritis". Patients often come to the hospital with a diagnosis of Bright's disease, made by the family or insurance examiner on these findings. Many cases previously diagnosed as chronic Bright's disease return after a few years with the same picture. The pressure, dyspnea, or cardiac hypertrophy may be greater, but their renal function is normal.

Chronic nephritis is a progressive disease, varying in different individuals, depending upon the degree of original damage, the pressure and type of infectious foci in the body, the frequency, and the type of intercurrent infections, etc.

It is very important to differentiate vascular hypertension from chronic nephritis. While both may show albumin and casts (signs of renal damage), the lesion of vascular hypertension in the kidney is slight and confined mainly to the vessels, while the chief injury in the case of the chronic nephritic kidney is in the renal parenchyma. The latter is usually progressive, while in the former type progress is slow. For the purpose of prognosis it is most important to differentiate the two conditions. The patients suffering from vascular hypertension die mainly as a result of cerebral hemorrhage, a few from cardiac disease, rarely from uremia.

Owing to error in diagnosis in distinguishing between the two, the vascular hypertension case is often treated vigorously by purging, sweating, prolonged protein diet, etc. There is no direct evidence that low protein diet is of benefit. In itself it seldom reduces pressure or relieves the symptoms, and, furthermore, the patients excrete nitrogen well.

The patient with vascular hypertension may be recognized clinically by his healthy appearance, lack of renal symptoms, and by physical and laboratory examinations, especially by the tests of renal function.

Twenty-five cases of vascular hypertension were studied as to blood-pressure, urine examinations, phthalein examination, blood chemistry, and the two-hour test meal. The cases show albumin and casts as often as in chronic nephritis. The maximum specific gravity is usually higher than in chronic nephritis. All cases show good phenolsulphonephthalein excretion, only 4 cases excreting between 40 and 50 per cent: the other figures varied between 50 and 72 per cent.



The blood chemistry, or urea nitrogen, was normal in all cases except 3, and these were within the limits of normal. The two-hour test meal showed similar findings of fairly good renal function. A few cases showed slightly increased night output of urine. The author thinks this should normally be 600 c.c.

The summary of his conclusions is:

(1) The specific gravity of the urine shows no loss of power of concentration, as in chronic nephritis.

(2) Albumin and casts appear in the same quantities in both diseases.

(3) The functional tests show but little renal impairment.

(4) A markedly increased night volume of urine indicates a possible death from renal involvement.

(5) It is important to differentiate the two conditions of vascular hypertension and chronic nephritis, and tests for renal function offer the best means.

This is an excellent and timely article, and has therefore been abstracted rather fully. The author is to be congratulated on such a brief yet thorough presentation of the subject.

M. W. BANOWITCH.

MOSCHCOWITZ, E., The Treatment of Hypertension. *American Journal of the Medical Sciences*, 1920, clix, 517.

Moschowitz previously expressed the theory that hypertension is a primary pathological physiological state, and that arteriosclerosis and nephritis are secondary manifestations consequent upon the hypertension. He now discusses the treatment upon the basis of this theory, under the following headings:

(1) Instruction of the patient, with a tactful explanation of the nature and significance of hypertension.

(2) A simple and varied diet, limited only when reduction of weight is desired. The author does not believe that a high protein diet, in hypertensive states, influences either the quantity of albumin or the hypertension.

(3) Graduated and systematic exercise. This is important; as

a result the pulse becomes slower, and slight irregularities and extrasystoles disappear. The systolic pressure is lowered, but the diastolic pressure is lowered to a greater degree, so that the pulse-pressure is increased. The latter two are a good indication of improvement. It is the ratio and not the height of the pressure that determines the prognosis and connotes improvement.

(4) Rest. This is indicated when there is evidence of circulatory failure, high systolic and diastolic pressures, accompanied by signs of premonitory cerebral hemorrhage, and in long-standing cases with severe dyspnea and general enfeeblement.

(5) Drug treatment to maintain the best possible circulatory function. As in valvular and muscular defects of the heart, the main drug for this purpose is digitalis. It slows the heart-beat and tends to lessen any irregularity. Nitrites diminish blood-pressure, but the effect is transient. Iodids are given in cases with a luetic history. Chloral hydrate given over a long time reduces the blood-pressure and acts as a good sedative. Caffein is used in the decompensated states of hypertension, where a diuretic effect is desired.

M. H. KAHN.

CRUMMER, L. R.: The Diagnostic Significance of the First Sounds of the Heart. *The American Journal of the Medical Sciences*, Jan., 1920, elix, Part 1, No. 574, p. 20.

The apical systolic murmur interpretation quoted in Circular 21, Surgeon General's Office, by Janeway, and previously mentioned by Lewis, offers no standard for cardiac examination. Crummer calls attention to the standard of comparing the first sound over the right and left ventricles. The right side gives a more normal or standard sound because disease of the tricuspid valve is rare. Comparing the left first sound as heard at the apex, to the right first sound, we find that it may be increased, diminished, absent or may show complete changes in character. A transmitted first right in the left apex must not be misinterpreted. The exercise test in myocarditis with relative mitral insufficiency will cause the first short sound to disappear and to be replaced entirely by a systolic murmur. This is due to the lack of muscle-tone. When this first short sound at the apex, shorter than the normal first sound on the right side,

persists through the exercise test, the diagnosis of mitral insufficiency must be dismissed entirely or the diagnosis of mitral stenosis must be added, especially when exercise produces breathlessness and peripheral cyanosis. A snappy first sound accompanies mitral stenosis, and the most typical snap is made by button-hole mitral stenosis. Only from 30 to 40 per cent of mitral stenosis cases have the classic combination of presystolic thrill, presystolic roll, and snappy first sound.

In Graves' disease the first sound is shortened on the right and left side, has a peculiar stroke, and is rapid. In neurocirculatory asthenia the right first remains normal while the left first simulates the quality of the thyroid heart.

Infectious diseases and so-called surgical shock cases lead to the tick-tack heart, in which the first and second sounds are alike, caused by gradually increasing loss of tone; from six to twelve hours before death one sound is lost. Crummer remarks that after the beginning of the tick-tack stage stimulation of the heart-muscle cannot be effected, but that before this stage stimulation by the caffeine group frequently brings about an improvement.

A. T. MAYS.

PRITCHARD, E.: The Causation and Treatment of Rickets. *British Medical Journal*, Nov. 15, 1919, No. 3072, 627.

The essential and central feature of rickets is the want of calcification of developing bone. This, in turn, is due to the existence of requirements for calcium, which are more urgent than the need for calcification; these requirements are for neutralizing acid bodies in the blood. All chronic conditions of malnutrition terminate in acidosis, and all alkaline bases must contribute toward neutralizing these bodies before the calcification of bone may be attended to. Most of the etiological factors of rickets are included in this category of causative factors of acidosis. Breast milk contains an adequate supply of calcium, and there is an excess in cow's milk. Hence the want of calcium, *per se*, is not the explanation in the majority of cases. Defective absorption is a more reasonable explanation, and there is evidence that the calcium is eliminated in excess in the urine or feces, or in both. Other factors are: intes-

tinal intoxication, endocrine disturbance, bad air, lack of exercise and a deficiency of vitamins. Any of these may lead to acidosis as the ultimate result, and the treatment is to remedy the faulty hygienic conditions, and to supply suitable food in proper amounts.

L. C. JOHNSON.

MERKLEN, P.: Cardiac Instability During the War. *Archives des maladies du coeur*, 1920, xiii, p. 27.

"Cardiac instability" is the best term to designate the great variety of functional heart disturbances that the war has emphasized. The manifestations of this condition indicate above all an instability to time and degree in the cardiovascular functions. Tachycardia constitutes its most constant and prominent feature.

Aubertin has shown that the condition also exists in civilian life. In a good proportion of cases, it seems to have followed some acute infectious disease, such as rheumatism or scarlet fever. In some cases a neuropathic constitution seems to have been predisposed to cardiac instability.

According to Gaillard, relative or absolute hypertrophy of the left ventricle develops in about half of the cases as a result of the prolonged tachycardia. The aorta widens also, and develops an increased dynamic response.

Differential diagnosis of cardiac instability must be made from a number of other conditions: idiopathic or nephritic hypertension with palpitation and tachycardia; pulmonary tuberculosis; tuberculosis cured in infancy, yet presenting dyspnea, palpitation and fatigue on exertion with tachycardia; other pulmonary conditions and cases with the symptoms due to nasal obstruction; the group of functional cardiac symptoms of gastro-intestinal origin. Particularly following the acute infections, cardiac instability may develop with no previous constitutional tendency to explain its occurrence. Lewis, Gallavardin, Crouzon and Manger, Clere and Aimé, etc. have therefore reasoned from effect to cause, and attribute the pathogenesis of cardiac instability to the acute infections, especially rheumatism and scarlet fever. Exophthalmic goiter, in its rapid toxic form, must also be differentiated from cardiac instability. Alquier, in 1914,



and later Gallavardin and Martinet, emphasized the frequent association of thyrotoxicosis with cardiovascular instability.

The pathogenesis of all these types of cardiac instability finally and essentially depends upon stimulation of the great sympathetic nervous system, whether by toxins of tuberculosis, infectious diseases, digestive disorders, thyroid secretion, or other factors.

Sympathetic stimulation manifests itself in various ways, even in the same individual. It is usually intermittent, and alleviated by rest, but it may appear in a severe form. Tachycardia is its first physiologic expression, together with flushing of the face, precordial pain, palpitation and dyspnea. The peripheral circulation is affected, producing cold cyanosed extremities, with mottling. The blood-pressure, which is particularly unstable, is sometimes raised, even at rest. The high pressure indicates a hypertonicity of the vessels rather than a hypertension proper. Kahn emphasized that there exists in these cases hypertonicity of the heart-muscle. That is, stimulation of the sympathetic system has a vasoconstrictive effect upon the vessels, and increases their tonus. In many individuals, peripheral vasoconstriction produces a habitual pallor.

Cardiovascular instability is, therefore, one of the manifestations of sympathetic disturbance and is the most easily perceptible one. Laubry and Esmein showed the presence of a variable lymphocytosis and irregularities of temperature, which they consider part of the sympathetic syndrome.

The symptoms of cardiovascular instability, especially the tachycardia, are exaggerated by effort and excitement. The cardiac functional capacity in these cases is usually normal as studied by functional tests, as Martinet has shown. The war may be blamed for the production and aggravation of many cases, especially important factors being the trenches, coffee and thyroid poisoning voluntarily produced to secure exemption, shell-shock, gassing, emotional states due to the war, etc. Cardiovascular instability should therefore be viewed as produced by the combination or resultant of all the factors producing sympathetic stimulation.

In the treatment of these cases, the first attempt should be made to control the mental state of the individual, which, in fact, is the first agent to be invoked for medical aid in any malady. States of anxiety and fear, the feeling of economic insecurity, and the emotions should be appeased and quieted.

Once established, cardiovascular instability persists by autosuggestion, with increase of emotionalism and anxiety, forming a vicious cycle. Whether or not there are several distinct types of this condition has not yet been determined. At present, in describing cardiovascular instability, one must be content with a summary of the symptoms and the manifestations in each particular instance.

M. H. KAHN.

VISWALINGAM, L. M. S.: Some Further Observations on the Etiology of Pellagra. *Journal of Tropical Medicine and Hygiene*, 1920, xxiii, 46-47.

The author believes that pellagra among the Chinese is due not only to dietary deficiencies but to a superadded infection. He believes that the individual is infected through the alimentary tract. The seasonal recurrence of symptoms in patients removed from their surroundings and placed in a hospital, with adequate diet, for long periods of time, would point to the presence of an endotoxin resulting from the evolution of some organism, or probably the establishment of a vicious cycle brought about by profound metabolic changes. Among the predisposing causes may be mentioned dysentery, ankylostomiasis, malaria and scurvy. Evidences of one or the other of these diseases were present in 60 per cent of the cases.

F. HULTON-FRANKEL.

KOOPMAN, J.: Hypophysal Diabetes. *Endocrinology*, Oct.-Dec., 1919, iii, No. 4, p. 485.

The polyglandular origin of diabetes is emphasized, and the fact that the pancreas is not the only gland which may be a causative factor. There is experimental evidence that the hypophysis has to do with sugar metabolism, and the association of glycosuria and acromegaly is well known. The latter disorder is not a true diabetes, in that patients rarely die in coma, and there is a slight tendency to the formation of acetone bodies. Investigations show that in lesions of the hypophysis there is diabetes, but the pancreas is normal. Two cases are cited which were at first treated as or-

dinary diabetes, but there was no simple ratio between the quantity of ingested carbohydrates and the amount excreted in the urine. After a few days of feeding of hypophysis gland, 1/10 grain (0.00648 gram) three times a day, the tolerance for carbohydrates was remarkably elevated, but increased protein intake brought about glycosuria. If the gland treatment was discontinued the old symptoms appeared.

L. C. JOHNSON.

ALLEN, F. M., AND MITCHELL, J. W.: Report of Diabetic Service at U. S. Army General Hospital, No. 9, Lakewood, New Jersey. *The American Journal of the Medical Sciences*, Jan., 1920, clix, Part 1, No. 574, p. 25.

A total of 40 cases was received; 3 proved to be of so-called renal glycosuria. A summary of the entire observation is given in detail, including the possible causes. Six patients had hereditary tendencies. There were 2 Jews and 3 negroes; more of the former and fewer of the latter would have been expected. One was mentally inferior. There was no evidence that diet was a primary cause in any case. A few cases were considered to be of nervous origin, resulting from accidents and shell explosions. The association of syphilis was demonstrated in 4 cases. Other infections were mentioned, such as bad teeth (found in 6 cases), chronic tonsillitis (in 17), acute tonsillitis (in 1). Several of these cases followed influenza and pneumonia. One patient had scarlet fever six weeks before admission.

The treatment began with the discovery of abnormalities. Carious teeth were filled or extracted; syphilis was treated, and tonsillectomy performed when necessary. In no case did the diabetes thereafter run a different course from the average. As permanent damage has generally been done in the pancreas in such conditions, the authors consider it unreasonable to expect a cure of diabetes by removal of the infectious cause. The direct treatment was initial fasting until glycosuria ceased. This was followed by a diet of protein, generally containing a small amount of carbohydrate, until hyperglycemia and acidosis disappeared. The diet was then built up, especially with fat—"maintenance diet"—the allowance of all



three classes of foods being governed by the severity of the case and the normal blood-sugar and negative acetone reactions.

*Results.*—One patient had advanced tuberculosis and died in five months. Another entered with a middle ear abscess and died of meningitis. One had an uncontrollable diabetes and died. Two others died at intervals of two and three months after being discharged. It is an interesting fact that although all diabetic patients were exposed to the influenza epidemic none acquired it.

A. T. MAYS.

ROLLESTON, H.: Dyspeptic and Other Referred Symptoms Associated with Disease of the Gall-bladder and of the Appendix. *British Medical Journal*, March 6, 1920, No. 3085, p. 317.

By referred symptoms are meant those which do not at once suggest local disease of the organ really responsible, or that are remote in point of place, when the disease of the gall-bladder or appendix is not acute. The complications discussed are those resulting from a previous acute attack, or a recurrent or chronic inflammation. There are four factors in the mechanism of the production of symptoms, reflex, mechanical, toxic, and infective.

Irritation in the appendix or gall-bladder may cause hypertonus and spasm or failure to relax on the part of the pyloric or ileocecal sphincter, leading to gastric or ileal stasis, and so to excess of acid or to toxemia. The referred pain and the disturbances of micturition and defecation are due to an irritated focus in the spinal cord, with a reflex spread of impulses. Pericholecystic adhesions lead to interference with the passage of food from the stomach, and even to deformity of that organ, while adhesions about the appendix cause stasis and toxemia. Absorption of bacterial toxins from the gall-bladder or appendix lead to a general toxemia, and myocarditis. Bacteria from either may infect the kidneys, especially the right one, and malignant endocarditis has also been found as an associated condition. Inflammation of the gall-bladder and appendix are frequently associated, and probably the appendix is affected first.

Disease of either gall-bladder or appendix may produce definite symptoms of gastric or duodenal disorder, without any localizing symptoms. It is important to prevent the infection of either by



the elimination of septic foci in the mouth, tonsils, and nasopharynx, early correction of intestinal infection, and of constipation. In gall-bladder dyspepsia, the cholecystitis causes both cholelithiasis and dyspepsia. These symptoms, more common in women than in men, are very variable, and it is not possible to make a diagnosis between chronic gall-bladder and appendicitis, from the referred dyspeptic symptoms alone. In diagnosis the *x*-ray is of decided benefit, giving positive evidence of gastric or duodenal ulcer or, in the case of appendix disease, of partial filling or stasis of barium in the appendix, constrictions, dilatations, and concretions. Adhesions about the gall-bladder are characterized by the high position of the stomach, displacement of the pylorus to the right, distortion of the duodenal cap and of the hepatic flexure of the colon, and retention of food in the stomach for from six to eight hours. The pain of gastric ulcer is relieved by taking food, and by alkalis, while that of referred dyspepsia is often aggravated by food, and is resistant to alkalis. Occult blood in the stool is more frequent in ulcer, and often in the latter there are periods of complete freedom from symptoms, and hyperchlorhydria. Chronic colitis, pyelitis and pyelonephritis, and myocarditis, are not uncommon in either appendicitis or gall-bladder disease, and pancreatic disease with diabetes is not infrequently associated with gall-stones. Synovitis and arthritis, on the other hand, are rarely found with these infections.

L. C. JOHNSON.

GALLOWAY, SIR J.: Two Cases of Chronic Renal Disease. A Contrast in Treatment and Prognosis. *British Medical Journal*, Oct. 4, 1919, No. 3066, p. 431.

One was a case of chronic interstitial nephritis with a high blood-pressure. The patient appeared for treatment with a beginning uremia; he died in spite of all therapeutic measures. The other was a case of parenchymatous nephritis. The patient presented a marked anasarca, and was not relieved of this symptom until his diet had been changed to bread, rice, green vegetables, and fruit, with milk, eggs, and rabbit, representing a daily caloric intake of 2,625 calories, the bulk of which was obtained from albuminous foods. At the same time fats were restricted. In three days the urinary output

increased from 16 ounces to 42 ounces, and a week later was from 48 to 64 ounces. Seventeen days after this new régime, it reached 94 ounces in twenty-four hours. The anasarca disappeared, and the amount of albumin fell from 14 grams to 0.5 grams per liter. Within three weeks from the beginning of this treatment the patient's general condition was so changed that he begged to be allowed to go to work. This case is offered as evidence that in this type of nephritis, where anasarca dominates the picture, as Epstein indicated, the diet should be rich in albuminous foods, rather than restricted.

L. C. JOHNSON.

BABCOCK, R. H.: The Diagnosis of Chronic Cholecystitis Complicating Cardiac Lesions. *Journal of the American Medical Association*, Dec. 27, 1919, lxxiii, No. 26, p. 1929.

Babcock calls particular attention to the tendency of physicians to regard pain and tenderness when associated with cardiac disease, as due to the heart condition. They thereby fail to recognize the possible presence of an independent local trouble. He cites as an instance the combination of inflammation of the thoracic muscles with valvular heart-disease as a coincidence which may lead the careless diagnostician, to pronounce the patient suffering from pain due to myocarditis. He goes on to show how easily one may in like manner overlook concurrent disease of the gall-bladder and heart. Doubtless many cases of valvular disease are complicated by gastrointestinal disturbances with passive congestion of the liver and all its train of dependent disturbances, but very often definite disease of the gall-bladder may exist quite independently of an already existing heart lesion, and the gall-bladder symptoms may be overlooked, unless the observer is on the watch. In like manner, chronic suppurative gall-bladder disease may aggravate an existing cardiac trouble. It may supply the focus of infection from which the heart condition takes its rise. In considering the admittedly difficult differential diagnosis between cardiac disease with liver complications, and cardiac disease with independent concurrent liver or gall-bladder trouble, Babcock emphasizes the following points as of diagnostic value:

(1) In passive hepatic congestion the organ preserves its natural outline unless this is prevented by adhesions or by changes produced by cirrhosis. When congestion only is present, the left lobe is palpable and tender, as well as the right, and the notch between the two lobes can be detected. Venous stasis may usually be found in other organs as well. Where these signs are absent and the symptoms are being referred to the abdomen, rather than to embarrassed breathing, the liver and not the heart should be suspected.

(2) The enlargement of the right lobe associated with acute gall-bladder disease, and known as Riedel's lobe, which is characterized by enlargement of the right lobe downward to the right with a sharply convex bulging, should always be borne in mind.

(3) Ewald's area of hyperesthesia indicates gall-bladder disease. This is most pronounced over the tenth and eleventh intercostal nerves. Stroking the skin of the back from above downward will bring out the greater sensitiveness on the right side, when the gall-bladder is inflamed.

(4) Changes in the leukocyte count and in the temperature may be suggestive in more acute cases.

(5) A particularly careful history is essential.

H. G. WEBSTER.

ARKIN, A.: Rat Bite Fever. Report of a Case. *Archives of Internal Medicine*, Jan., 1920, xxv, No. 1, p. 94.

A boy in West Virginia was bitten by a rat March 25, 1919. The wound was shortly afterward painted with tincture of iodine and healed. After a period of fourteen days, inflammation, edema, and induration appeared, accompanied by lymphadenitis and lymphangitis, and the appearance of a blue-red exanthem. There were also high fever and chills and gastric disturbances. This attack was followed by three others at intervals of about six days, each characterized by fever, chills, nausea, headache, and pains in the extremities. Reappearance of the exanthem with these attacks was noted. There was marked lymphadenitis of the trochlear and axillary glands. The spleen was not enlarged. Albuminuria and cylindruria were observed. A blood examination revealed leukocytosis, which disappeared during the afebrile periods and returned with the paroxysms.

Spirochetes were not found in the peripheral blood, and cultures and animal inoculations proved negative, but these examinations were made some time after the onset of the disease. The subsequent history reveals recurring attacks of fever at longer intervals and of less intensity, the last paroxysm recorded being in June.

T. HOWARD.

GARDINER, J. P.: Acute Dilatation of Postpartum Uterus as a Cause of Postpartum Hemorrhage. *Journal of the American Medical Association*, Dec. 27, 1919, lxxiii, No. 26, p. 1915.

Basing his remarks upon 3 cases of postpartum hemorrhage, the author gives a rather full discussion of the uterine conditions which permit such an occurrence, and then points to the analogy between acute dilatation of the uterus and acute dilatation of the stomach, bladder, intestine, myocardium and other hollow organs, including the blood-vessels. He calls attention to the fact that the stomach may function properly until after the stress of an operation, when acute dilatation is by no means uncommon, and that acute dilatation of the heart may not appear until some time after the stress which preceded it has subsided. He compares these late relaxations to conditions of the postpartum uterus. He therefore concludes that the properties of unstriated muscle include rhythmic contraction and retraction and "the property to functionate normally for a time, after a period of stress, then to assume a state of acute relaxation, and further, within a limited time, to react on stimulation, and return to their normal functioning".

H. G. WEBSTER.

PATEL: Hypertrophy of the Breasts Treated by Subcutaneous Injections of Human Milk. *Lyon médical*, Apr. 25, 1920, cxxix, No. 8, pp. 361-362.

The patient, a woman of twenty-four, after an attack of grip 6 months ago, noticed an increase in the size of her breasts. The hypertrophy increased until the breasts became voluminous. The weight of each was estimated at 5 kilograms (13.4 lbs. troy).



Suction by means of a Bier cup, and deep thermocautery were without result.

Subcutaneous injections of 5 c.c. (1.35 fluidrams) of human milk were given on alternating days, ten injections in all. The breasts began to decrease in size on the fifteenth day, and rapidly became normal. This has persisted, and the patient is now apparently cured.

Microscopical examination of excised specimens of the hypertrophied breasts showed normal, inactive mammary gland tissue.

S. KAHN.

WEBER, F. P., AND GUNewardENE, T. H.: Sequel of the Case of Lipodystrophia Progressiva Shown on January the 24th, 1919. *British Journal of Children's Diseases*, London, 1920, xvi, 200-204.

The authors present necropsy findings in what they claim to be the first published report of postmortem examination in a case of lipodystrophia progressiva. The patient was a girl of thirteen years of age who died from chronic pyemia following mastoiditis and suppurative otitis.

The body was wasted, and by naked eye examination the fat was seen to be practically completely absent from the subcutaneous tissue of the upper part of the body above the pelvis. A moderate amount of fat was present in the gluteal regions, orbits, omentum, about the kidneys, heart and pericardium, and under the serous membranes. Had the child died from some disease not associated with extreme wasting, there would doubtless have been much more fat left in the regions unaffected by the lipodystrophia.

In the microscopical sections of the scalp and abdominal wall the only evidence of fatty tissue which could be detected was the presence in the scalp of a few small areas which may have been occupied by fat-cells. In the absence of special stains, it is not possible to exclude the presence of some fat-cells, but the sections suffice to show that fatty tissue is almost completely, if not completely, absent.

One of the sections of the suprarenal glands includes a little of the surrounding retroperitoneal tissue. Definite fatty tissue is present.

In no section are there lobules of embryonic fatty tissue such as are found in the fetus and in infants during the first and even second years of life.

No abnormality was found in either the ovary or pituitary body.

In the suprarenal bodies there appears to be less lipoid tissue in the cortex than is usual at the age of thirteen years. The effect of the infection which caused death cannot be excluded.

In the thyroid there is an excess of secretion of colloid. This degree of excess is often found at postmortem examinations. It falls far below that which frequently occurs at puberty. Little significance can be attached to this excess of colloid if it is the only unusual feature, but this excess appears to be associated with fibrosis, and with an actual diminution in the size of the gland.

The thymus gland was represented by a scanty remnant.

M. B. GORDON.

GUISEZ, J.: The Etiology and Pathogenesis of Primitive and Grave Spasms of the Esophagus (De l' étiologie et pathogénie des spasmes primitif et graves de l' œsophage). *Bulletin de l' Académie de médecine*, Jan. 17, 1920, lxxxiii, No. 7, p. 147.

The esophagus is not merely a tubular organ, but a real visceral cavity. It pays an active part in deglutition, and this activity is most important at both ends, oral and cardiac, where the sphincterian fibers are more strongly developed. When trying to ascertain the etiology of a spasm of the esophagus, we must keep the above statement in mind. The spasm is not produced by a slight wound in the rather insensible mucosa of the esophagus, or by the nervous contraction of its fibers, as was formerly thought, but it is merely a physiological reflex which appears when the patient tries to swallow the food before it has been properly prepared by mastication. These spasms are most frequently observed in patients who have the bad habit of eating quickly on account of their professions. The repeated swallowing of improperly prepared food will produce an intermittent spasm that will later become permanent. Finally a true permanent contraction of the sphincter is produced, with the sequelae of retrodilations, hypopharyngeal diverticles and large dilations in the thoracic portion of the esophagus. The inflam-

matory element is added to the poor situation, and a permanent inflammatory stenosis of organic character is brought about.

The treatment to be used at first, before the esophagic stenosis is established, consists merely in educating the patient to masticate properly and thoroughly. In the advanced cases, when stenosis is present, this latter condition is combated by local dilatation, the treatment being completed by reëducation in mastication. The condition may be observed in nervous and hysterical individuals, but occurs more frequently in rather calm persons. This leads the author to think that the esophagic spasms observed in hysteria have the etiology stated above, hysterical individuals being prone to swallow their food without masticating it.

C. F. ARROYO.

MALLIE, H.: Pulmonary Sequelæ of Hyperitus Burns (Mustard Gas) [Les séquelles pulmonaires de l'hyperite]. *Journal de médecine de Bordeaux*, Jan. 10, 1920, No. 1, p. 9.

The lung lesions of hyperitus<sup>244</sup> are infected burns. The evolution of the sclerotic healing of the lung lesions is different from the evolution of the healing in tegumentary tissues. After the slow anatomical healing, functional modifications arise. These modifications refer to respiration, because the surface of hematosiis is smaller, and to the circulation, as a result of the deficient hematosiis. It is true that the functional activity of the healthy parts of the mucosa will try to fill out the gap, but we know that any continued abnormal hyperactivity provokes fatigue and collapse. The alterations, merely functional at the beginning, become structural and may be produced in all of the organs, so that the irrigation, nutrition and activity of these organs may be permanently altered. This complex condition, composed of fine histological lesions and persistent functional modifications, is described as *bronchopulmonary debility*. This is a very short-sighted denomination. A burn of the mucosa of the lungs can not be considered cured after the scar has been formed. The true consequences of the original lesions do not appear until a long time after the local process is healed. The consequences are especially grave when the patient already shows a bronchopulmonary weakness, produced by some other cause, such as arthritis,

heredosyphilis, tuberculosis, influenza, measles, or any other infections. Dr. Mallié accepts the classification of the pulmonary sequelæ of hyperitus given by other authors: common emphysema, offensive congestion and pseudotuberculosis. The complications may be pulmonary suppuration (lung abscess) or purulent pleurisy, but they are infrequent. Furthermore, the hyperitus burn may be the door of entrance for a generalized infection of the system. The hyperitus burn may predispose the lung to tuberculosis, or may cause old and torpid lesions to flare up, although this is very doubtful. The medical treatment of the sequelæ of hyperitus burns in the lungs consists in the use of general tonics, sulphur, iron, arsenic, creosote and hydrothermal measures, but is generally deceiving.

C. F. ARROYO.

McNALLY, W. D.: A Report of Five Cases of Poisoning by Nicotin. *The Journal of Laboratory and Clinical Medicine*, Jan. 1920, v, No. 4, p. 213.

Death by nicotin-poisoning is very infrequent. Nicotin is a liquid alkaloid, existing principally in the leaves of tobacco. One cigar contains a quantity of nicotin sufficient to prove fatal to 2 persons if injected directly into the circulation. In nearly all cases of nicotin-poisoning death occurs in from a few minutes to a few hours after injection. The author cites 5 cases which occurred during the last two years due to the patient's taking insecticide containing nicotin, which he mistook for whiskey.

The free alkaloid is a colorless oily liquid which rapidly becomes brown in color. It closely resembles whiskey in appearance, and this accounts for its accidental consumption. A postmortem was made upon 2 of the cases and showed an intense hyperemia of all the organs. The stomach was highly congested, had an odor of alcohol, and showed chemically large quantities of nicotin.

The author gives several tests for nicotin, the most delicate of which is the silicotungstic method. In a dilution of 1 in 300,000 of nicotin, in the presence of one-tenth of one per cent of hydrochloric acid, an opalescence appears almost immediately. If the solution stands for a time, a definite crystalline form will appear (Bertrand and Juvillier). Silicotungstic acid does not form such



insoluble precipitates with all alkaloids. Conoin, for instance, which is of interest in this connection, for the reason that it is also volatile with steam, yields no precipitate with silicotungstic acid at dilutions greater than 1 in 5,000.

C. M. ANDERSON.

RUSSEL, W.: Hypochlorhydria and Air Swallowing. *British Medical Journal*, Dec. 13, 1919, No. 3076, p. 769.

Hypochlorhydria occurs less frequently than hyperchlorhydria, and the symptoms are: heaviness, or load in the stomach, followed by distention or a feeling of fullness, relieved to some extent by eructations, but more surely by vomiting. The complaint of sourness or acidity is absent, and there is not the same degree of mental and physical inability as is observed in hyperchlorhydria. These patients do not tolerate proteins well, particularly milk, and bland, soothing nourishment is to be avoided.

"Air swallowing", distinguished from "air sucking", is a condition in which air is swallowed when food is taken, and the discomfort occurs immediately after each meal. It is associated with abnormal gastric secretion, either hypo- or hypersecretion, but more frequently with the former, and is relieved when this error in secretion is corrected.

L. C. JOHNSON.

McELROY, W. S.: Methemoglobinemia, Due to Bromoseltzer Poisoning. *Journal of the American Medical Association*, Dec. 27, 1919, lxxiii, No. 26, p. 1927.

The writer reports the case of a man of thirty-six, who had been taking bromoseltzer in varying doses since 1911, gradually increasing the dosage, until in the early part of 1919, he was taking from four to five 5 oz. bottles full a day. His chief symptoms were nervousness, frontal headache, dizziness, and shortness of breath on exertion. His mucous membranes were cyanotic, his skin was pale and dry, and he had grown quite thin. When admitted to the hospital in the latter part of April, the patient was delirious and re-

mained so for about a month. All symptoms, except slight dyspnea, had disappeared by the time of his discharge from the hospital at the end of June. The method of determining the blood-changes is described and commented upon, and the point is made that the method of determining the hemoglobin by a color scale does not give the true picture of the oxygen-carrying power of the blood. This, however, may be estimated by determining the oxygen capacity.

H. G. WEBSTER.

PIERY: The Cardiovascular Syndrome of Chlorin-gas Poisoning. *Lyon médical*, July, 1918. Abstracted in *Archives des maladies du coeur*, 1920, xiii, 7.

In cases of chlorin-gas poisoning one finds the cardiovascular syndrome of tachycardia and hypotension. On the first day there is a transient hypertension, which gives place to a low systolic and diastolic pressure associated with asthenia. The tachycardia is prolonged and marked. In the treatment of this syndrome, strychnin sulphate in large doses has given good results.

M. H. KAHN.

BULL, P.: Results of the Treatment of Pulmonary Tuberculosis by Extrapleural Thoracoplasty. *Norsk Magazin for Lægevidenskaben*, Nov. 11, 1919, lxxx, No. 11, p. 1105.

Bull reports 37 cases, in all, in which he used this method of treatment. It may be used in cases in which an artificial pneumothorax cannot be performed because of dense pleural adhesions, which prevent collapse of the lung.

The operation is performed in two stages with a four weeks' interval. Local anesthesia is used. In the first stage the sixth to the eleventh ribs are resected. In the second, the upper ribs are resected.

The author considers that cure was established in 11 of his cases.

S. KAHN.

## SECTION ON

### LABORATORY AND RESEARCH

NOGUCHI, H.: Etiology of Yellow Fever. X. Comparative Immunological Studies on *Leptospira Icteroides* and *Leptospira Icterohemorrhagia*. *The Journal of Experimental Medicine*, Feb., 1920, xxxi, No. 2, p. 35.

The author had reported in a previous paper that the serum of convalescent yellow fever patients had a more or less marked antagonistic effect upon *Leptospira icteroides* derived from certain cases of yellow fever in Guayaquil, as was manifested by a positive Pfeiffer phenomenon in the peritoneal cavity of the guinea pig. In some instances the serum protected the pig from a fatal infection with the organism. A similar result was obtained with the serum of guinea pigs which had recovered from a non-fatal experimental infection with the leptospira.

The present paper takes up more fully the question of immunity, particularly with regard to agglutination, lysis, complement-fixation, Pfeiffer's phenomenon, etc., with immune sera prepared in rabbits and horses by repeated inoculation of *Leptospira icteroides*. Experiments were also carried out to determine the relation of this organism to *Leptospira icterohemorrhagia* of infectious jaundice, by means of cross-immunity reactions *in vitro* and *in vivo*.

Monovalent immune serum prepared by successive injections in an animal naturally refractory to *Leptospira icteroides* was found to possess the power to agglutinate *in vitro* not only the homologous strains, but also all other strains of icteroid tested. A slight effect, or none at all, was observed when these immune sera were treated *in vitro* with various strains of *Leptospira icterohemorrhagia*. A similar relation exists between the monovalent anti-icterohemorrhagia sera and the various strains of *Leptospira icteroides*. The Pfeiffer

reaction gave a sharper differentiation between the two groups, for in most instances the phenomenon was specific for the group.

Polyvalent immune serum, one specific for icteroids, and the other for icterohemorrhagia, showed a high titer of neutralizing power for the cultures of the homologous groups. It was found, however, that action of the sera was by no means absolutely specific, inasmuch as the injection of a sufficient amount of the anti-icteroides serum apparently prevented a fatal outcome in the case of a guinea pig inoculated with multiple minimum lethal doses of a culture of *Leptospira icterohemorrhagia* and *vice versa*. The specificity of the serum was demonstrated only when it was used in smaller quantities.

More or less specificity was shown by the complement-fixation reaction. Weak fixation occurred when the anti-icteroides serum was mixed with one or the other of the icterohemorrhagia strains of *vice versa*. Strong fixation occurred only when the antiserum was mixed with one of the icteroid strains. On the basis of the findings of the strains studied (13 strains), it seemed probable that *Leptospira icteroides* and *Leptospira icterohemorrhagia* were closely allied, but, nevertheless, distinct in their immunological reaction. The difference between the two may amount to that between subspecies or races. The pathogenicity of the two is also distinct, icteroides producing chiefly icterus and nephritis, and icterohemorrhagia, hemorrhage and nephritis, the icterus being less and the hemorrhage more prominent in the evolution of the latter infection.

In the study of active immunity, exclusive of vaccination, difficulty was experienced in the evaluation of the results, owing to the existence of natural resistance to infection among guinea pigs. In the present study, therefore, only those guinea pigs were selected which had reacted typically, though in mild degree, to the icteroides infection, in order to determine whether they were subsequently immune to the inoculation of icterohemorrhagia. Indeed, by this mode of experimentation it was found that the guinea pigs which had once passed through an attack of the icteroides infection were absolutely immune to a second infection with the same organism but reacted severely, and sometimes fatally, to a later inoculation of icterohemorrhagia. Although there were a number of instances in which a previous infection with icteroides did not confer any perceptible immunity upon the guinea pigs against icterohemorrhagia, another group of guinea pigs showed considerable resistance to the ictero-



hemorrhagic infection as compared with those which had never been inoculated with icteroides. There is not much doubt, therefore, that an icteroides attack brings about, in some instances at least, a certain degree of resistance to the icterohemorrhagic infection. Hence the study of the phenomena of active immunity strongly indicates that icteroides is closely related immunologically to icterhemorrhagia.

H. M. FEINBLATT.

NOGUCHI, H.: Etiology of Yellow Fever. VI. Serum Treatment of Animals Infected with *Leptospira Icteroides*. *The Journal of Experimental Medicine*, Feb. 1, 1920, No. 2, p. 159.

The high potency attained by a polyvalent immune serum for *Leptospira icteroides* derives from the horse, as revealed in previous experiments on guinea pigs, indicated the possibility that such a serum might be advantageously employed in the treatment of patients infected with the organism. Several series of experiments were made in which guinea pigs were first inoculated with multiple minimal lethal doses of the above and then treated with the immune serum at varying intervals afterward.

The use of the serum was found to be of definite advantage in checking the progress of the infection. When administered during the period of incubation, it completely prevented the development of the disease, although on subsequent examination small or extensive hemorrhagic lesions were found in the lung-bed of the pigs that survived. The serum, moreover, modified the course of the disease and, when used in early stages of the infection, prevented a fatal outcome. Employed at a later stage, when jaundice and nephritis had been present for several days and the animal was near collapse, the serum had no perceptible beneficial effect.

H. M. FEINBLATT.

WOLBACH, S. B.: Studies on Rocky Mountain Spotted Fever. *The Journal of Medical Research*, Nov., 1919, xli, No. 1, p. 91.

The author, who has made an extensive study of this disease at the request of the Montana Department of Health and the State Board of Entomology, has published three previous brief reports on

the subject. In this communication he submits a monograph of about two hundred pages, including detailed protocols of all his experiments and a "comprehensive review of all subjects relating to Rocky Mountain spotted fever". The occurrence of this specific disease is limited to the habitat of the wood tick *Dermacentor venustus*, that is, the states of Idaho, Montana, Nevada, Oregon, Utah, Wyoming, California, Colorado, and Washington.

Clinically it is characterized by an incubation period of from three to twelve days, most cases developing between the fourth and eighth days after the discovery of the feeding tick. The onset, which is usually abrupt, is marked by a chill, followed by pains in the bones and muscles, in the head, back, and large joints. Cough is common, and injected eyes and photophobia are usually seen. The temperature rises gradually for about a week and then, as in typhoid fever, maintains a fairly high level with morning remissions for another week. It gradually subsides during the course of the third week. The pulse is disproportionately rapid. The rash appears on the third or the fifth day, first on the wrists, ankles and back, then on the forehead, arms, legs, and chest, lastly on the abdomen, where it is least marked. At first the rash consists of rose-colored macule from 1 to 5 mm. in diameter, which disappear on pressure. They gradually increase in size and become purplish in color, often frankly hemorrhagic, and tend to coalesce. With defervescence the rash fades but may leave pigmented areas for some time. Necrosis of the skin may occur during the third week, most commonly on the scrotum, prepuce, fingers, toes, and ears. Restlessness and insomnia are common. Delirium and coma occur in the severer cases. Cutaneous hyperaesthesia is frequently seen. The leukocytes number less than 12,000. An increase of the large mononuclears is rather characteristic. Some of these are seen to be actively phagocytic, enclosing erythrocytes and lymphocytes. These cells are probably of vascular origin, as the characteristic lesion of the disease is an endangitis.

The causative organism is shown to be a microorganism, which was seen by Ricketts, but was confused by him with bacteria which may be present in non-infective ticks. This parasite appears in three definite morphological types: (1) an extranuclear bacillus-like form without chromatoid granules, relatively large and only present in ticks during the initial multiplication of the parasites, (2) a relative-

ly small rod-shaped form with chromatoid granules, probably the same form seen within nuclei in sections of ticks, and in rare cases in smooth muscle cells in the blood-vessels of mammals, and (3) a relatively large lanceolate paired form present in ticks and in the blood and lesions in mammals. This lanceolate form is characterized by its "chromatoid" staining reaction, and, according to the evidence at hand, is the form in which the virus is passed between the tick and the mammalian hosts. The other two forms described are multiplicative stages, and can only be demonstrated occasionally and with difficulty in mammalian hosts. The name *Dermacentroxenus rickettsi* is proposed for this parasite.

T. HOWARD.

STOKES, A., AND BIGGER, J. W.: A Short Account of Dysentery in Dublin in the Autumn of 1919. *The Dublin Journal of Medical Science*, March, 1920, Series iv, No. 1, p. 3.

In the epidemic of dysentery in Dublin in 1919, there were 76 proved cases of bacillary dysentery. Of this number all but one were caused by the organism of the Shiga group. The specimens for culture were rarely obtained when less than four hours old, but in spite of this there was little difficulty in isolating the organism in fairly early cases. The following table shows the results of cultures according to the nature of the specimens examined:

Description	Number	Percentage positive
Blood and mucus	30	100
Mucus	10	40
Swab	13	30
Feces	24	16

Agglutination tests were very irregular.

The organism causing this epidemic was not of a very virulent type. Of three strains which were inoculated alive into rabbits in considerable doses (2,000, 2,500, 5,000 millions) none produced any serious reaction. Furthermore, the death rate was low, being approximately 10 per cent.

G. A. DISTLER.

McCALLUM, W. G., LINTZ, J., VERMILYE, H. N., LEGGATE, T. H.,  
AND BOAS, E.: The Effect of Pyloric Obstruction in Relation  
to Gastric Tetany. *Johns Hopkins Hospital Bulletin*, Jan.,  
1920, xxxi, No. 347, p. 1.

MacCallum and his associates found in their experiments on dogs that when the pylorus was completely obstructed and the stomach frequently washed out, an animal wasted rapidly and died in a few days, usually with violent convulsions, which were not of precisely the same nature as the twitching seen in parathyroid tetany. It is known that if a communication be established between the stomach and the intestine by a gastro-enterostomy, so that the contents can once more pass into the intestine, the symptoms disappear at once.

In the latest experiments, the stomach and pylorus were separated just above the pylorus, and the stomach was closed off with sutures so that it became a blind sac on the end of the esophagus. The pyloric end of the duodenum was then sutured into the abdominal wound. Through it food and water were given. This opening was closed except for a tube which was used to prevent the loss of bile and intestinal contents.

When food containing chlorids was given, the symptoms following the obstruction came on more slowly and the animal lived about a week. When nothing but distilled water was given, convulsions appeared in about forty-eight hours and death soon followed. Such a result could not be due to starvation, because a dog will live a long time without food.

Numerous estimates of the stomach washings showed that the stomach continued to secrete hydrochloric acid while the body chlorids and the urinary chlorids diminished rapidly. It seems that the gastric mucosa can still exercise its function of secreting hydrochloric acid even when the plasma chlorids are diminished.

Since the chlorid lost in the gastric juice is in the form of free hydrochloric acid, it seemed probable that the sodium-ion would be retained in the circulating fluids and that the alkali reserve of the blood might be increased.

Therefore, a study was made of the changes in the plasma chlorids, the alkali reserve, as determined by Van Slyke's method, and the electrical excitability of the nerves.



In brief they found that, especially in those cases in which no chlorids were given by the intestinal fistula, the recognizable chlorids in the plasma dropped quickly. The average course taken from 12 cases was as follows, beginning with the day of the operation: 6.6, 6.4, 5.1, 4.6, 3.9, but in some cases the chlorid content of the plasma fell to 2.5 and 2.8.

The carbon dioxid combining power was found to rise as the chlorids decreased. Averaging once more 8 cases in which it was tabulated, we find that the change proceeds as follows, beginning with the day of operation: 46.2, 42.4, 55.2, 61.1, 66.6, 71.9, 74.7, 80 (vol. in c.c. per 100 c.c. blood).

The electrical excitability of the nerves increased in an approximate ratio.

When chlorids were injected into the blood stream after the symptoms were well developed, they regularly caused a disappearance of the convulsions and a general improvement in the condition, with a lowered electrical excitability.

Dogs which received 10 grams of sodium chlorid daily, in the distilled water, lived for a week or more without symptoms and maintained a constant proportion of plasma chlorids and alkali reserve as measured by the carbon dioxid combining power. Moreover, the electrical excitability of the nerves remained normal.

Regarding the whole alteration as being due to the excess of sodium base left in the blood, they tried to replace the chlorin-ion by the introduction of hydrochloric acid. These attempts were without success, whereas the introduction of sodium chlorid had a life-saving effect; it prevented the changes in electrical excitability, and disturbance of the alkali reserve, as well as the occurrence of symptoms.

The administration of calcium salts (lactate), as in parathyroid tetany, exerted only a temporary effect and had no controlling influence, as in parathyroid tetany.

The injection of excessive quantities of sodium carbonate and bicarbonate produced the same symptoms: twitchings, convulsions, opisthotonos. The alterations in electrical excitability, parallel with those in the alkali reserve, are the same in the two conditions.

Hence the conclusions from the experiments are, that when the pylorus is obstructed and the hydrochloric acid is constantly removed there ensues a decrease in plasma chlorids and a marked in-

crease in the alkali reserve, which becomes extreme. This is prevented by constantly furnishing chlorids.

The convulsive movements are different from the tetany of parathyroidectomy, in which no increase in the alkali reserve was found.

DE F. LAYTON.

GOECKEL, H. J.: The Early Diagnosis of Typhoid and Paratyphoid Infections. *The Journal of Laboratory and Clinical Medicine*, Jan., 1920, v, No. 4, p. 255.

After extended study the author has made the following conclusions:

Although it is stated that the typhoid and paratyphoid bacilli appear in the urine some time after the second week of infection, the cases examined showed:

(1) It is possible to obtain and identify them in the urine by agglutinins before the blood shows a positive Widal reaction or a typical cell-count.

(2) By this means a prompter report is given than if blood culture is resorted to.

(3) It is a more definite method of identification of the infection than is the identification of agglutinins in the patient's blood serum.

(4) It is more positive, and eliminates reliance in the Widal reaction on blood serum.

(5) It should be resorted to, whenever possible, in the case of patients who may have a natural or acquired agglutinating capacity, due to previous infection or to the use of vaccines.

C. M. ANDERSON.

MAIGNON, F.: Study of the Influence of Fats on Protein Metabolism. The Use of Fats in Diseases Resulting from Azotemia. *Lyon médical*, Apr. 25, 1920, cxxix, No. 8, pp. 368-370.

Maignon studied the effects of an exclusively protein diet (ovalbumin) on white rats and dogs, as well as the influence of the ad-

dition of fats (lard) and of carbohydrates (starch) on the utilization of the protein.

The albumin is utilized better in the organism when fat has been added than when starch is the other food element, and with less toxic and greater anabolic results. Through the glycerin content, the fats act as an agent of condensation of the amino-acids. By means of the fatty acids, which are chemically akin to the amino-acids, the fats enable the latter to undergo certain changes, which are necessary for the building up of the protein for use in the tissues.

The *fat-protein* ratio in the diet is, therefore, of great importance, and the validity of the theory of the value of a minimum of fat necessary for the economic and non-toxic utilization of protein is questioned.

The effects obtained clinically from the use of cod-liver or vegetable oils in cachexia, associated with a loss of body nitrogen, can be explained only by the action of the fat on the nitrogen (protein) metabolism. This effect cannot be obtained by the use of carbohydrates.

In conditions which are the result of an azotemia, also, as in eczema, rheumatoid affections, etc., the ingestion of fats gives good therapeutic results.

In administering fats, it should be remembered that they are not to be given as a supplement to the food, but as a substitute for some of the other food elements. The urinary acidity should be maintained at a normal level by the administration of sodium bicarbonate.

S. KAHN.

MILLS, R. G.: The Pathologic Changes in the Testes in Epidemic Pneumonia. *The Journal of Experimental Medicine*, Nov. 1, 1919, xxx, No. 5, p. 505.

The survey includes the study of the testes of a number of soldiers between the ages of eighteen and forty. The cases were classified into three divisions: first, primary pneumonia—pneumonia occurring during the measles epidemic, but not preceded by an attack of that disease; second, pneumonia following measles; third, pneumonia following epidemic influenza. The first included 11 cases, 8 of which were due to the *Streptococcus hemolyticus*; the other three

groups were associated with other organisms. The second included 18 cases, only 3 of which were of lobar pneumonia; in 2 cases pneumococci were found; in 6 there was lobular consolidation, and 12 cases took the form of interstitial bronchopneumonia. The third group showed no lobar consolidation; 2 were cases of interstitial bronchopneumonia and the other 3 of confluent bronchopneumonia.

The author concludes: "Testicular changes in pneumonia are without clinical manifestations, are non-specific, focal in character, independent of the infecting organisms or the antecedent disease, and vary in severity directly with the total length of the illness. The process is a continuous one, divisible into stages in which the following features are recognizable: (1) cessation of spermatogenesis; (2) degeneration of preformed spermatocytes, spermatids, and spermatozoa; (3) desquamation of altered cells and fragments of the same; (4) formation of giant-cells in the tubule walls with subsequent liberation into the lumen; (5) disappearance of all desquamated cells and all those derived from the spermatogonia by mitosis; (6) in some instances thickening of the hyaline layer of the basement membrane.

"Older lesions are frequently found which continue the structural alteration of the tubules by hyalinosis and destruction of cells until they ultimately disappear. These lesions are not believed to be connected with the present illness.

"Edema may represent the acute injury in another form, and round-cell infiltration suggests that possibly factors other than toxins may have a part in the tissue alterations.

"In the absence of definite evidence to the contrary, the cause is assumed to be circulating toxin, as Wolbach claims for influenzal cases.

"The hemolytic streptococcus produced more extensive changes, both epithelial and interstitial, in primary pneumonia occurring during the measles epidemic than when pneumonia followed as a secondary infection; in the latter cases the pulmonary complication covered a relatively shorter period. Measles and epidemic influenza had little apparent effect upon the testes, except that the former caused mild inhibition of spermatogenesis. Evidence regarding the latter is inconclusive.

"The Pfeiffer bacillus was always associated with other organisms in primary infections and in those following measles. It occurs



alone in a few cases after epidemic influenza, but the testicular lesions are not distinctive.

"The pneumococcus, when alone in primary infections, or after an epidemic disease, produced a uniformly mild picture which was not intensified when associated with the influenza bacillus.

"Giant-cells were much more frequent after influenza-pneumonia, regardless of its cause, and were associated with large numbers of other desquamated cells. They were formed in the walls of tubules by futile mitotic effort and incomplete protoplasmic separation, the abnormality of a process being further suggested by the early severing cytoplasmic attachments and rapid desquamation."

H. M. FEINBLATT.

MOORE, J. E.: The Cerebrospinal Fluid in Multiple Sclerosis. *Archives of Internal Medicine*, January, 1920, xxv, No. 1, p. 58.

The findings in the cerebrospinal fluid in 20 cases of multiple sclerosis and in 8 cases of suspected but not established multiple sclerosis, are presented in this article. Eighteen of the 20 known cases showed a parietic gold curve; this type of curve did not appear in any of the suspected cases, the latter showing three so-called syphilitic curves and five negative tests. Of the positive group, pleocytosis (over 5 cells) was found in 8, and positive globulin in 18 cases. Of the doubtful group, pleocytosis was present in all cases and positive globulin in 6. Moore believes that such a spinal fluid picture is fairly constant, and, together with the clinical evidence, presents strong evidence in favor of a diagnosis of multiple sclerosis.

T. HOWARD.

GREGG, H. W., LUTZ, B. R., AND SCHNEIDER, E. C.: The Changes in the Content of Hemoglobin and Erythrocytes of the Blood in Man during Short Exposures to Low Oxygen. *American Journal of Physiology*, 1919, 1, 216.

As indicated by the title, this paper deals with compensatory blood changes under low oxygen and pressure. The experiments had for their practical object the improvement of elimination tests for aviators. The results were obtained by two methods; exposure in a low

pressure chamber and submission to 10 per cent oxygen at normal atmospheric pressure. In the first method, the low oxygen tension was secured by lowering the barometric pressure to 380, 395 and 425 mm. Hg., corresponding to pressures ordinarily encountered at 18,000, 17,000 and 15,000 feet altitude. The low tension was secured in the second method by replacing the oxygen gradually with nitrogen until 10 per cent oxygen was reached. The low oxygen tensions were maintained for periods ranging from thirty to one hundred and forty-five minutes.

Blood for the estimation of hemoglobin was taken from a finger and from a vein. The determinations were made by the Gower-Haldane carbon monoxid method, by the Palmer method, and by a modified Palmer method in which hydrochloric acid was used.

An increase in hemoglobin was obtained under reduced barometric pressure in 78 per cent of all examinations made. The majority of the men required from forty to sixty minutes for the increase to become definite, 13 per cent showing a well-defined increase within twenty-six minutes. In the experiments with 10 per cent oxygen, 57 per cent showed an increase in hemoglobin.

In the 15 cases in which the erythrocytes and hemoglobin were determined, corresponding changes occurred in both, and 66 per cent were positive. The erythrocyte increase ranged between 3.8 per cent and 20 per cent, the hemoglobin, between 3.2 per cent and 9.8 per cent. In repeated experiments on the same individual the increase in the hemoglobin was approximately the same each time.

The authors state that a decision as to the value of the concentration theory and the theory of the dormant supply of erythrocytes as explanations of these increases in hemoglobin cannot be made at this time, but the subject is discussed at some length and the concentration theory seems to find little support from these experiments.

W. H. EDDY.

SECHER, K.: Functional Tests of the Heart. *Tidsskrift for Læger*. Copenhagen, 1919, lxxxi, 1891.

Secher refers to tests that are simple enough for office and house practice. He commends in particular the Katzenstein, Rehfisch and Schrumpf methods.

Schrumpf states that with a normal heart the pulse returns to its former beat in four minutes after slight exercise, such as bending the knees ten times.

Katzenstein's test has to do with the difference in pulse and blood-pressure before and two minutes after digital compression of the femoral artery for from two to two and a half minutes. A rise in blood-pressure, and lower blood-pressure, indicate a normal condition. An abnormally pronounced rise in blood-pressure is found with arteriosclerosis and hypertrophy of the heart. No rise in blood-pressure indicates weakness of the heart. If the pulse is not modified, the weakness is slight, but if the pulse becomes faster, the heart must be regarded as decidedly insufficient. A drop in blood-pressure with accelerated pulse indicates severe insufficiency. This test can be applied to the reclining patient, and Secher's experience with it in 50 cases demonstrated its approximate reliability. In some cases it excluded organic heart disease, and the course later confirmed these findings.

The Rehfisch method employs auscultation before and after bending the knees ten times. Bock's differential stethoscope, used in this connection, eliminates the personal equation in estimating the findings.

M. H. KAHN.

WIGGERS, C. J., AND CLOUGH, H. D.: Physiologic Investigations into the Dynamic Action of the Heart in Functional Cardiac Disorders. *Journal of Laboratory and Clinical Medicine*, St. Louis, 1919, iv, 624.

Wiggers and Clough present the following conception as to the cardiac derangement in cases of functional cardiac disorders and at least certain types of compensated organic lesions: The normal heart possesses a mechanism whereby the systole is shortened when the rate is accelerated. This is especially evident when the rate is increased beyond 80 beats per minute. The musculature, while subjected to more frequent periods of contractile stress, is automatically spared to some extent through a shortening of the systole. In functional cardiac disorders this compensatory mechanism (whatever its nature and cause) may be entirely abrogated, or, what is

more common, does not become operative until the heartbeat has been accelerated to a far greater extent (from 100 to 120 beats per minute). In other words, whenever the functionally disordered heart is accelerated above 80 beats per minute, its period of systole is not shortened as is that of the normal heart, and consequently the myocardium is exposed more frequently to a prolonged period of contractile stress. This condition, favoring the onset of rapid cardiac fatigue, is more serious, since the hearts of such subjects are usually rapid even at rest. It appears that the same deficiency in the adjustment of systolic length to the duration of the cardiac cycle exists in many organic heart cases. Owing to the fact, however, that the heart-rate in these individuals is usually slow, at least during rest and moderate activity, the myocardium is in this way spared from the consequences of contractile stress.

M. H. KAHN.

COHEN, M. B.: The Choice of Sera in the Treatment of Meningococcus Sepsis. *The Journal of Laboratory and Clinical Medicine*, Dec., 1919, v, No. 3, p. 176.

In the treatment of this disease by intraspinal injection of immune serum a number of observers have noticed variations in the therapeutic result following the use of different sera. These differences were explained on the basis of the existence of various serologically different strains of meningococcus.

The group of meningococcus bacteria is a heterogeneous one, and there are at least four strains or varieties which may be separated by serological methods. Commercial polyvalent sera are supposed to contain immune bodies for the four main groups. However, many cases have not responded properly to serum treatment.

As most sera are now tested for potency by agglutination reactions against known strains, and as this method is rapid and is less subject to error than the other available serologic procedures, the agglutination reaction has been selected as an index of potency of a serum against the organism isolated from the spinal fluid of the patient.

C. M. ANDERSON.



## SECTION ON PEDIATRICS

MCCREADY, E. B.: Nervous and Unstable Children. *Archives of Pediatrics*, Oct., 1919, xxxvi, 552.

The prevalence of the unstable individual in the physician's waiting room, in sanatoria, in juvenile courts, etc., is an increasing menace to the state. The cause may be hereditary, or the condition may be due to environment in early life. Often it is due to improper metabolic functioning; anything which interferes with the latter, such as improper or insufficient food, acute or chronic disease, fatigue, reflex irritation, lays the foundation for later trouble.

To correct these faults, modify the environment to meet the child's needs. Remove them from home environments where either total indifference or over-anxiety prevail. Keep them under the absolute charge of a physician. The proper regulation would include sufficient rest to overcome the fatigue, a well-balanced diet, fresh air, cleanliness, regulated exercise, and a well-regulated school system calculated to take into account the fact that memory and abstract reasoning are not the sole assets of a well-rounded education.

T. B. GIVAN.

GROSZMANN, M. P. E.: The Relation of Physical and Mental Factors in the Diagnosis of Difficult Children. *Archives of Pediatrics*, Oct., 1919, xxxvi, 563.

The author reiterates the great need of recognizing and correcting certain physical defects, so that the mental process may develop proportionally to the body, or *vice versa*. As Bain says, "The organ of mind is not the brain itself; it is the brain, nerves, muscles, organs of sense, and viscera". Interference with the proper functions of any of these systems means a more or less corresponding

impairment of function of the mind. The latter is a matter of degree, and not all inmates of prisons are mental defectives; they are rather psychopathic personalities. These should be singled out in early childhood.

The author emphasizes the necessity of a systematic correlation of effort between health and school officials, parents, social workers, and physicians, in order to obtain the desired end.

T. B. GIVAN.

FARNELL, F. J.: Early Nervous and Mental Signs in School Children. *Archives of Pediatrics*, Oct., 1919, xxxvi, 549.

Often the parent, the teacher or the medical examiner pass over as unimportant the many little vagaries that creep into the child's life. Spells of indigestion, nervousness, bed-wetting, or even convulsions, kleptomania, fits of temper, sex indiscretions, hemophilia, are phenomena which are often unrecognized until a true psychoneurosis has developed. These "little" defects, if interpreted early, may be corrected in nearly every instance.

The author points out by case reports that there is usually an emotional, a negative, and a sexual disorder. These may be combined in one or two symptoms.

T. B. GIVAN.

LEVY, J.: Is Feeble-mindedness Always a Hereditary Disorder? *Archives of Pediatrics*, Oct., 1919, xxxvi, 558.

The author believes that a certain number of the cases of mental backwardness are due to disarrangements of the activators of the internal secretions of the body. Developmental retardation is a matter of degree and may be overlooked by the casual observer in many mild cases. If these cases are recognized in early infancy, and progressive doses of the extracts of the glands of internal secretions, particularly the thyroid, anterior pituitary and thymus, be administered, mild degrees of backwardness may be ameliorated.

A case showing considerable retardation is presented in detail. Thyroid gland was given for six months and pituitary gland for

eighteen months. Marked improvement in the child's development, physically and mentally, was the result.

The author thinks that if treatment were begun before the sixth month, more marked improvement would result.

T. B. GIVAN.

SEHAM, M.: Ataxias of Childhood. *Archives of Pediatrics*, Oct., 1919, xxxvi, 531.

There has been no definite classification of the cerebellospinal ataxias of childhood, due in part to the frequent similarity of the symptoms in cerebellar and spinal disease, due also to marked variations in the pathological findings, and again to the fact that primary cerebellar diseases may present no symptoms. Several cases are reported which the author classifies as Friedreich's ataxia, a combined sclerosis of the posterior and lateral tracts of the spinal cord. These cases present similar but no definite train of symptoms. With these are contrasted, in tabulated form, Batten's 3 cases of congenital-cerebellar ataxia, the features of which are (1) early onset, (2) negative family history, (3) cerebellar symptoms predominating over spinal, (4) improvement or recovery, (5) normal mentality, (6) equal, normal or exaggerated reflexes.

In closing, the author concludes, from his review of 17 cases of spinal and cerebellar disease, that it is best to classify these conditions topographically, depending, upon whether the predominating symptoms are cerebral, cerebellar or spinal.

T. B. GIVAN.

WALKER, C.: Ectopia Cloacæ. *Journal of Pathology and Bacteriology*, 1919, xxiii, 109-113.

A child which was born, according to maternal calculation, at seven months, lacked the left kidney and ureter. The cloaca still persisted, and its posterior wall was formed by normal colon mucous membrane and the lateral walls by the bladder mucous membrane. The right ureter opened into the right lateral wall. Tubes formed by the Müllerian ducts were found near the junction at the lateral

and posterior walls on each side. Two large diverticula, each with a smaller diverticulum, lay one on each side of the mesentery, and their mucous membrane corresponded to that of the large intestine. Their morphology is unexplained. There was evidence that the lower portion of the Müllerian ducts were bilateral, unfused uteri and vagina. The bladder existed in two portions. All other structures normally anterior to the lumen of the pelvic colon were absent. The condition was described as ectopia of the cloaca with bilateral colon-like diverticula. The child lived twelve days.

F. HULTON-FRANKEL.

WEITZEL, J. S.: Diagrammatic Charts of Electrical Reactions in Tetany. *Archives of Pediatrics*, Aug., 1919, xxxvi, 477.

The information obtained by measuring the electrical reactions in active and latent tetany is diagrammatically illustrated by the author.

The principal points noted from the charts are:

(1) The A.O.C. was never greater than the A.C.C., except in one instance.

(2) The K.O.C. showed greatest variation and was the first pole to show marked improvement, followed by the A.C.C. and in a few days by the A.O.C.

(3) There was temporary improvement in one case after an acute intestinal upset, when the excess potassium and sodium salts were eliminated.

(4) The effect on the reactions by the intramuscular injection of magnesium sulphate was noted, all poles reacting at less than 3 milliamperes after the injection of 10 c.c.

(5) In testing the reactions of 25 marked cases of rickets, it was found that 96 per cent showed signs of latent tetany.

T. B. GIVAN.



# SECTION ON ROENTGENOLOGY AND ELECTRO- THERAPEUTICS

## A COLLECTED ABSTRACT OF THE LITERATURE ON ROENTGENOLOGY FOR THE YEAR 1919

By I. SETH HIRSCH

*Diseases of the Thoracic Viscera*

(Continued from p. 480)

Roentgenology of the chest has received much support, in the year 1919, from the influence of the diagnostic activities rendered necessary by military work. At the various camps and cantonments an opportunity was afforded by influenza and its attendant evils for the study of the lung conditions. The great value of the roentgenological examination in diseases of the lungs was demonstrated, because large numbers of patients could be examined from time to time, from the beginning of the disease to the end. The genesis of the inflammatory conditions of the lung and their complications were thus studied in detail. Further than this, the examination of a large number of recruits permitted a correlation between the clinical findings and the *x*-ray findings. The result of this has been to place the value of roentgenology in diseases of the chest permanently before the profession and to establish it definitely as an essential method of diagnosis in the diseases of the lungs and heart.

### A. DISEASES OF THE LUNGS

#### *Pneumonia*

I. Seth Hirsch (The Roentgen Diagnosis of Influenza—Pneumonia and Its Complications. *American Journal of Electrotherapeutics and Radiology*, April, 1919) states that it is only recently that even the roentgenologist has been able to establish, with any degree of exactitude, the principles upon which the roentgen diagnosis of disease of the lung is based.

The practitioner of medicine and surgery does not always understand the general philosophy of the roentgen art, much less that part of the art relating to disease of the thorax. This phase of the subject is more difficult to comprehend, requires keener analysis, closer study and a deeper knowledge of clinical medicine, than any other. The normal and pathological changes in the bones or joints, or in the gastro-intestinal tract, are more or less static. These changes take place slowly, and their varying aspect, under the stress of pathological invasion, is capable of classification, because of a certain constancy in their variability. But in the chest, the constantly changing air, and the vascular content of the lung, the almost endless variation in the bizarre designs which the pulmonic markings form, the rapid variations in the density of these markings, the constantly varying aspect of the heart and the diaphragmatic domes, the astonishing rapidity with which the pathological conditions vary, all contribute to render the study of the chest fascinating but very difficult.

It is important that the normal aspect of the roentgen picture of the chest be understood and the meaning of the language—the roentgenographic language—used to describe the picture, be known. For there must be a language of definite, generally accepted terms, to express the characteristics of that record of densities called a roentgenograph.

*Pulmonic Illuminations.*—We call the triangular areas on either side of the median shadow pulmonic fields, because they correspond to the areas occupied by the lungs. In the same sense as we speak of the illumination of a window by a lamp held behind it, so we speak of the illumination of the pulmonic fields by the roentgen light, if I may use the term in reference to it. This illumination is shown in tones of black on the photographic plate.

Certain extraneous factors excluded, we say the illumination of the pulmonic fields is dependent on the air content, the more aërated the whole lung or a portion of it is, or the more air the whole thorax or a portion of it contains, the brighter the illumination of a whole or a portion of the pulmonic field.

Let us consider percussion. By this method of examination do we not seek to obtain the same data—the state of aëration of that portion of the thorax under examination? By the study of the pitch and quality of the note elicited by percussion, the air content of any par-

ticular area is determined. Observe how the findings correspond; in emphysema the note is hyperresonant, and there is increased illumination of the pulmonic field; in consolidation there is dullness and diminished illumination; in effusion there is flatness, and absence of illumination of the pulmonic field. In pneumothorax, with a pleural cavity filled with air and the lung more or less retracted, there is almost tympany to percussion; pneumothorax also gives a brilliantly illuminated pulmonic field. So that the signs elicited by percussion, and the data inferred by a study of illumination gives us, one audibly and the other visibly, evidence relating to the air content of the lung.

The examination by percussion has this disadvantage, however, that areas of emphysema will mask the dampening of the sound, which an area of consolidation should produce. Thus, a striking feature in many of the pneumonia cases is the absence of physical signs over the particular area of involvement. A peculiar tympany is frequently found over an area in which the roentgenograph shows a localized area of infiltration; for the latter, the *x*-ray examination shows both the emphysema and the infiltration. Even where dullness is elicited, the roentgenograph shows more extensive areas of consolidation than the signs indicated.

*Pulmonic Markings.*—Radiating outward from the central shadow formed by the heart and great vessels, toward the periphery, are fine lines. These are called pulmonic markings. They are the conglomerate shadows of the bronchi, arteries, veins, lymphatics and the stroma, which bind them together. All these structures contribute to the make-up of these linear shadows, but the greatest contribution is made by the fluid-containing structures, artery, vein, and lymphatic. Since, however, these shadows are anatomically in close relationship to the bronchi and bronchioles, the arteries lying laterally and above the bronchi, we assume the position of the bronchial though they are not normally visible.

The pulmonic markings converge toward the median shadow to form the hilum shadow. This does not correspond to the shadow of any one particular structure, but is an appearance due to the convergence of the shadows of the bronchi, artery, veins, lymphatics, pleural folds, lymph-nodes, etc. It is here that the larger bronchi may be visualized as streaks of illumination (due to their air content) bordered by linear shadows (their walls), when cut in longitudinal



section; oval areas brightly illuminated, when cut in oblique sections; discs of illumination, when cut in cross-section.

*Roentgenologic Anatomy.*—The *bronchiolus respiratoris* divides into two *ductuli alveolares* which lead to the atria, each of which communicates with *sacculi alveolares* around the periphery of which are situated the *alveoli pulmonum*. The pulmonary artery follows in all its subdivisions the course and the subdivisions of the bronchial tree, and each main branch arches over its corresponding stem bronchus and occupies a position posterior and lateral to the bronchus. The relation of the pulmonary vein is anterior and mesial to the stem bronchi.

The primary lobule or lung unit consists of an alveolar duct (d. al.) which springs from the respiratory bronchiole, the air spaces connected with it, atria (a) with their saccules (s. al) and, at the periphery of the latter, the ultimate alveoli (a. p.).

Several of these primary lobules constitute a secondary lobule. The parenchyma of the lung consists in these secondary lobules, which vary in size, those on the surface being larger and pyramidal in shape, with four- to six-sided bases, the width of the base being 12.5 mm., and the altitude of the pyramid 13 mm., the peak being toward the surface. The bronchial duct of the secondary lobule, being the smallest subdivision of the bronchi, is called the lobular bronchiole, is devoid of cartilage, and only 0.2 mm. in diameter, hence it is not visible roentgenographically, normally or pathologically, but the trunk from which it springs, the intralobular bronchus, has the structure of a bronchus. The latter is about 1 mm. in diameter and is accompanied by its artery and fibrous tissue stroma. Hence it may be visualized under pathological conditions when transversed in cross-section by the ray. The limitations of roentgenographic visibility compel us to consider the secondary lobule as the foundation of our study. Anatomically, the secondary lobules are distinct units, capable of isolation in the infant and adult lung, surrounded by connective tissue and vessels, and springing from a single interlobular bronchus. The area of illumination of the pulmonic field between the pulmonic markings is really due to the air content of the alveoli of the secondary lobules, and the pulmonic markings at their termination represent the vascular structures accompanying the interlobular bronchus (for the arteries of the neighboring lobules are independent of each other), the finer subdivisions in the primary



lobule or lung unit, and the still finer capillary system in the walls of the alveoli are not visible.

The pulmonary veins do not lie in as intimate anatomic relationship to the bronchi as do the arteries. Yet for practical purposes, with our present technic, it is sufficient to consider that the shadow of the vein merges with that of the artery. The arteries of the neighboring lobules are independent of each other, but the veins anastomose freely. With the circulation and the vascular content in a normal state, these anatomic branches of the veins do not usually cast shadows. But, as will be discussed later, when the circulatory conditions are abnormal and when the vascular content is markedly increased (by congestion), then these branches may be seen, causing the fusion of the markings and producing one of the roentgenographic signs of lung congestion.

The trachea is visible in the upper part of the dorsal spine shadow, and in the upper portion of the median shadow, as a brightly illuminated band (due to the air content) on a gray background, the dorsal spine shadow may be visible beyond the bifurcation. The importance of the close study of this shadow lies in its displacement when certain mediastinal, pulmonary or pleuritic conditions exist. Details of the trachea may sometimes be demonstrated. At times, the shadow of the main bronchi may be visible as far as their fusion with the hilum shadow, particularly on the right side where, however, it becomes part of the hilum, an interspace higher than on the left side.

The pulmonic markings extend outward from the central part of the field about four-fifths of the distance toward the periphery in plates technically well made. Under certain conditions and with a special technic, very rapid exposure with a very soft ray, the finer ramifications of the markings, extending to the very periphery of the field, may be shown. But for practical purposes, it is sufficient to consider that in a normal roentgenograph the markings extend outward for four-fifths of the distance into the pulmonic fields.

Viewed stereoscopically these markings are discrete, pursuing their course as far as their visibility permits them to be observed as isolated structures. The course of the main and important branches have been topographed and studied. This is Dunham's contribution to this subject, and it is no insignificant one.

Since these pulmonic markings are due mostly to the vessels of

the lung, by noting their number, size and density, we may estimate the vascular content of the lung. For, if, because of a lesion of the heart, or as the first stage of inflammation, there is a congestion of the lung blood-vessels, and therefore an increase of the vascular content, there should be no increase in the size, number and density of these markings. This is exactly what we find. This increase in size, number and density of the markings is designated hypervascularization. This hypervascularization may be local or general. Thus in the congestion of emphysema or cardiac disease, it is general. In the beginning or ending stage of a focal lung inflammation, it is local.

When congestion is intense, the markings lose their discrete character and anastomose or interweave. This appearance is due to the anastomosing branches of the veins which now, because of their engorgement and their increased fluid content, become visible.

*Pathological Changes.*—The first stage of inflammation is congestion. By this we mean that the blood-vessels, especially the capillaries and veins, contain an increased quantity of blood. That being so, this change would be registered roentgenographically by the pulmonic markings as an increase in the size, number and density (hypervascularization). The increase in the size would be noted by the finer markings, whose outlines are lost in the normal; the increase in number would be noted by the markings which become visible and which, with a normal blood content, do not have sufficient density for visualization; the increase in density would be noted by the markings previously visible but now casting a denser shadow. That appearance called the hilum shadow would, when congestion exists, show an increase in size and a distortion in outline, because the structures, which are responsible for it, each show increased size and density. The more severe the congestion, the more marked the changes in the markings and in the hilum shadows. The intense congestion so common in influenza-pneumonia is shown by that increase in size, number and density of the markings and the distortion or enlargement of the hilum shadow, the latter change being apparent even in the later stages, when the markings in the outer part of the field have been blotted out by infiltration.

The second stage of inflammation is exudation. There is an escape of white blood-cells from the capillaries and veins and the transudation of blood serum. In this epidemic there was a preponderance

of the red-cell elements, which gave the exudate a hemorrhagic quality, but from a diagnostic, roentgenographic viewpoint this peculiarity cannot be determined. When this occurs, the density of the markings in the bronchi is further increased. The narrowing of the lumen of the smaller bronchi by the exudation may prevent the normal aëration of the air-cells, and may be responsible for a slight diminution in the illumination of the particular portion of the pulmonic field. But in this area of diminished illumination the markings are still visible as isolated structures.

But, when the exudative process affects the parenchyma of the lung itself, the air vesicles become filled with the exudation and the air content is thus replaced by a substance of far greater specific gravity—fluid.

How is this shown in the roentgenograph? By a replacement of the area of normal illumination depending upon the nature of the lesion, these areas of diminished illumination will vary in their size, shape, density, distribution, and their relation to other shadows. These unilluminated areas bridge over the spaces between the pulmonic markings, so that now these lose their discrete character and become agglutinated. This bringing over or agglutination of the markings occurs first at the periphery, and rapidly spreads toward the root, until in massive lesions even the markings at their origin at the hilum shadow are obliterated. So that the end-result of the replacement of the air content by exudation is to blot out the illumination of a portion of the pulmonic field and the identity of the markings, and if these areas of a certain distribution bear a certain relationship to other structures we have the picture of lung consolidation.

(a) *Consolidation.*—The areas having these characteristics may be very minute or cover the full extent of an entire lobe or lung. When very small, and irregularly scattered throughout the field as ring-like shadows, the center of the ring being a highly illuminated disc, we consider them to be areas of peribronchial infiltration. These may remain discrete or, by confluence, assume the irregular shapes, dotted with discs of illumination and separated from other similar areas by brightly illuminated sections of the pulmonic field. However, the areas of obliteration of illumination may be large and homogeneous in tone, corresponding in position to lobule or lobe, and they may be sharply differentiated from the remaining part of the field.



When resolution takes place, the homogeneous tone of the shadows of consolidation in the pulmonic field gives way to an uneven illumination, areas of bright illumination appearing, which grow in extent until the pulmonic markings again become partially visible and then visible in their entire extent. But an increase in density and size, and a haziness in the outline of the markings, may persist long after the pulmonic illumination has returned to normal.

This may be due either to a persistent engorgement of the vessels or to a production of connective tissue in the perivascular structures or bronchial walls.

The pulmonary lesion of influenza in the majority of cases is bronchopneumonia, in a small percentage lobar pneumonia, in which the hemorrhagic elements are a prominent factor. The roentgenographic equivalent of bronchopneumonia, and the term used in reading the plate, is peribronchial infiltration, or peribronchial consolidation; likewise the roentgenographic term for lobar pneumonia is lobar infiltration or lobar consolidation. The terms broncho- and lobar pneumonia have no place in roentgenological nomenclature.

Bronchopneumonia is a productive inflammation of the walls of the bronchi and an exudative inflammation of the air vesicles lying adjacent to the bronchial walls. The process involves the medium-size and smaller bronchi. In contradistinction to lobar pneumonia, bronchopneumonia is productive, as well as exudative. It is the latter phase of the lesion, the productive inflammation, which is responsible for the frequency of the sequelæ, in the delay in the restitution of the lung to normal. (Parenthetically, it should be said, it is also responsible for the difficulty in differentiation by roentgenographic means of the disease in this stage from tuberculosis, because the pathology is practically identical, except that in one case the process is due to influenza, and in another to the tubercle bacillus.)

The pathological change in the massive lobar lesion is exudation in the air vesicles throughout the lobe, bearing, however, no particular relation to the bronchus as in bronchopneumonia. But even in this form of lesion, there was in many of the cases in this epidemic a production of connective tissue in the air spaces along the walls of the arteries and bronchi, so that when the exudative lesion disappeared, the productive inflammation continued to progress as an interstitial fibrosis of the lung with the sequelæ of bronchiectasis, gangrene, etc.



In the ordinary lobar pneumonia, shown as an area of lobar consolidation (complete obliteration of illumination and pulmonic markings), when exudative resolution takes place, there is complete restitution of normal illumination and of a normal conformation of the markings.

From a roentgenographic viewpoint, the pulmonary lesions in influenza are the following:

(1) Isolated areas of peribronchial infiltration in the lower lobes, which rapidly coalesce. In the active stage, these lesions show as circumscribed, unilluminated areas around a disc of bright illumination (the bronchial lumen), giving the shadow a ring-like appearance. Separating these patches are areas of brilliantly illuminated pulmonic field, the emphysema. In cases presenting mild systemic symptoms, the diminution in illumination was very slight, but, nevertheless, sufficiently distinct to indicate, when taken in consideration with the localized hypervascularization and fusion of the pulmonic markings, that an exudation into the air vesicles was present. So, even in these cases, the roentgenographic diagnosis of pneumonia was justified. When the exudative lesion subsided, the new connective tissue produced in the walls of the bronchi gives the pulmonic markings great density and a dull and irregular outline.

The physical signs over these areas of lung infiltration were inconclusive. A tympanitic percussion note, crepitant râles, and distant bronchovesicular breathing, were frequently obtained. The peribronchial infiltration in such cases was found to be distributed along the main bronchial trunks extending from the hilum to the apex or the base—the distribution being strikingly like that of tuberculous bronchopneumonia.

(2) Circumscribed areas of infiltration in the upper lobes, which did not show this tendency to coalesce. These patches of infiltration were most frequently located between the fourth and seventh ribs posteriorly in the midscapular line.

(3) Small foci of infiltration, diffusely scattered throughout both lungs, usually more numerous toward the root.

The diffusely scattered form shows as a mottling of the pulmonic fields, due to the small areas of absent illumination, which are irregularly scattered in every part of it, but mostly in the central part of the field. This appearance is strikingly similar to that due to

tuberculosis—the pathology of which it closely resembles, differing only in the absence of the tubercle bacillus and its subsequent evolution.

(4) Massive consolidation, showing as complete obliteration of the illumination of a part of the pulmonic field, distinctly separated from the rest of the field by a sharp and usually curved line of demarkation—the interlobar fissure.

There are three striking accompanying lesions:

(1) Intense congestion of portions of the lung uninvolved by exudate. This is shown by marked hypervascularization and an enlargement, distortion and increased density of the hilum shadow.

(2) Emphysema, both of the interlobar and vesicular type. The vesicular type involves not only masses of lung-tissue of the lobes not involved by the infiltration, but is irregularly scattered between the patches of infiltration, defining them sharply. The portion of the lung not infiltrated becomes markedly emphysematous and the air spaces may rupture the septa between the lobules becoming infiltrated with air. This may make its way through the mediastinum into the subcutaneous tissue of the neck and chest.

(3) In all cases, even those which do not pass beyond the stage of intense congestion, the bronchial and tracheobronchial lymph-nodes are swollen. The lymph-node enlargement shows as rounded areas of absent illumination, located near or in the hilum shadow, or merging with it.

The complications of the lesions are:

- (1) Pleural effusion.
- (2) Abscess of the lung.
- (3) Pericarditis.

It is not necessary to go into the roentgenographic appearance of these lesions, because their characteristics are not changed by the influenza lung inflammation.

The significance of the productive inflammation becomes important in the study of the sequelæ, for, although the exudative portion of the lesion may resolve as a lobar pneumonia, the productive inflammation may go on in the walls of the bronchi, extending to the septa between the lobules, and in the walls of the air spaces, practi-

cally obliterating them and the air. The necrotic inflammation and imprisoned air behind these constrictions of the bronchi may then produce cylindrical dilatations, or, in other words, the typical interstitial pneumonitis with bronchiectasis, and this is the condition found in a proportion of the cases of persistent pulmonary symptoms, after recovery from the acute attack.

The sequela of interstitial pneumonitis, with or without bronchiectasis, may exist with or without gangrene of the lung.

Such a process may follow reinfection of the lung from the overflow of an abscess. So that, besides the circumscribed latter lesion in one part of the lung, there may be a bronchiectatic condition in the lower part of the same or opposite lung.

J. A. Honeij (Influenza and Bronchopneumonia, a Study of the Epidemic from a Roentgenological Point of View. *The American Journal of Roentgenology*, May, 1919, vi, No. 5, p. 226) describes the roentgenographic appearance of influenza-bronchopneumonia as follows: On examination of the roentgenograms there is seen to be a general increase of density throughout the lungs. This density may be described as being of a hazy or smoky nature, which decreases the contrast between the normal lung transparency and the bronchial tree outline. This generalized density is somewhat greater from the apex to the base (inner half) and especially adjacent to the mediastinal border, thus obscuring to some extent the mediastinum and cardiac outline. The most marked changes are seen in the bronchial structures themselves. A greater number of vessels is seen than is usual in any other disease. They are more definite, although diffuse in outline. This peribronchial thickening, however, is seen very plainly around the hilus, extending outward in "sunburst" type and rapidly diminishing in size from the hilus to about the outer one-third of the lung. The peribronchial thickening extends upward, parallel to the mediastinum, and helps to obscure the mediastinal outline. The greatest thickening and greatest diffuse bronchial density is seen at the base, extending downward from the hilus, reaching the diaphragm outline and extending to just beyond the mid-clavicular line. This is more marked on the right base than on the left, largely because the left base is obscured by the heart, but probably also because the greater number of cases of marked bronchitis or bronchopneumonia occurs at the right base, and partly because



of the anatomical difference between the right and left bronchial structures. The diffuse density of the bronchial outline, although becoming most marked in some cases, never shows a "pussy-willow" effect unless a bronchopneumonia is developing. The distribution of the bronchi can be fairly well traced out but the difference between the bronchi and parenchyma is usually diminished.

In cases where influenza progresses as influenza toward recovery there is a gradual diminution, first, in the hazy generalized density and then in the diffuse density of the bronchial structure. The density around the hilus, due partly to peribronchial thickening, remains considerably longer. The hilus becomes affected very early. There is an immediate enlargement of the hilus and a marked increase of density with irregular outline, so much so that in no case is there any question of the reaction of the hilus. The irregular outline is due to peribronchial thickening. In a few cases there is definite enlargement of glands in the hilus region.

The mediastinum in some cases is somewhat increased in width, and the outline is shown to be increased in density. The diaphragm is, if anything, more dome-shaped; that is, the convexity is increased and the cardiophrenic angles become more acute. There is also some obliteration of the costophrenic sinus.

The heart shows a slight dilatation of the right auricle and, to a lesser extent, a slight dilatation of the pulmonic area. The heart as a whole is not enlarged.

The appearances as described are typical and consistent, so that a diagnosis of influenza and congestion may be made in almost every case. This diagnosis was made in several cases observed before there were any clinical signs to warrant such a diagnosis; and in 2 cases of tuberculosis a diagnosis of influenza and congestion was made a week after the onset of the disease, when tuberculosis was the only clinical diagnosis. In a few cases the changes were very light and these were invariably cases that led to a speedy recovery. Unilateral congestion was seen in a few cases, and these invariably recovered within a few days. In the case of an influenza suspect, a diagnosis of bronchitis was made and later clinically verified; and in another, a diagnosis of transitory congestion was made and was verified within forty-eight hours. This proved to be a case of serum reaction. These cases are quoted to emphasize the specific value of the roentgenological changes in influenza.



The appearances, therefore, of the lungs and bronchi show a very early and marked congestion of the parenchyma and bronchial tissues. It is an active congestion, as the bases in none of the cases show a greater congestion than the middle or upper portions. It also shows that the lower bronchial structures and the bronchi of large diameter are earlier and more markedly affected than the smaller and terminal branches. It shows also a marked lymphatic and glandular congestion and reaction as demonstrated by changes in the hilus area, and a diminution in pulmonary function as evidenced by the height and shape of the diaphragm. The cardiac changes also bear out the early congestion of the lungs.

*The Appearance of Bronchopneumonia.*—In the most typical cases; those developing gradually, the first changes seen, after those described under influenza, are apparently bronchial in nature. There is a greater irregular diffuse peribronchial thickening, so that the individual outline of the bronchi can be made out with difficulty. Then there occur small, more or less localized areas, most visible in the middle of the lung, from 6 to 8 cm. distant from the hilus, but in very early cases occurring nearer the hilus and most often in the lower part of the lung. These localized areas, superimposed and adjacent to the bronchial outline, somewhat resemble the "pussy-willow" stage in the budding of the willow branch seen in spring.

The next distinct stage is a spreading out of these areas to a confluent, more or less localized area, varying in size from approximately 3 to 6 cm. in diameter. If this occurs in the full pulmonary field, the localized congestion is light and hazy, not unlike a "powder-puff" in appearance, with an irregular, soft, diffuse outline. In a few cases resolution begins in this stage; but in the majority of cases the process progresses, the density increasing and detailed structures becoming obscured. The bronchial outline is no longer visible, and pulmonary changes become more extensive and definite. In short, a pseudolobar pneumonic appearance is seen. If this occurs at the base, the heart and diaphragm outlines are obscured, the sinuses are obliterated, and the density from apex to base becomes gradually greater. It frequently occurs that, after one portion of the lung has become consolidated and the process progresses, the next earliest changes are seen on the opposite side, extending outward from the hilus after primary hilus changes, in the same manner as previously described. Associated with the early bronchial changes there are

marked changes in the hilus on the side where these bronchial and pulmonary changes begin. The hilus becomes more dense and more definite in outline, and it also increases in size. In comparison, there is a distinct difference in the hilus on the opposite side, if the process involves that lung. When the process becomes extensive, the hilus outline becomes obliterated.

In the marked changes of bilateral pneumonia where the greater portion of both lungs is affected, the bases become so dense that a differential diagnosis between an extensive edema, pleural effusion and pneumonia, as such, cannot be made.

Invariably, as early as the changes occur in the hilus, there is seen in the heart a marked and acute dilatation of the right auricle and also dilatation of the pulmonic area. In a number of cases observed dilatation of the aorta also occurred. In a few cases in the later stages, dilatation of the left ventricle was also seen.

In the majority of cases the diaphragm on the side affected becomes more dome-shaped and its position is from one to two interspaces higher than normal. This is so marked and occurs so frequently that the fact is emphasized in the diagnosis of cases. In massive types of pneumonia the diaphragm is often lower than usual.

The changes described therefore show, first, the bronchial congestion with associated hilus changes; then, localized congestion of the bronchioles; and, finally, the congestion of the true parenchyma. The early dilatation of the heart accentuates the acute and rapid congestion of the lungs, and the marked changes in the diaphragm also indicate the early impairment of respiratory function on the side affected. In a few difficult cases noted there was some difficulty in differentiating true bronchopneumonias from the lobar type, and it is well known that the resolution in lobar pneumonias begins near the hilus and retrogresses toward the periphery, whereas in bronchopneumonias this is reversed.

*Lobar Pneumonia.*—In the 4 cases presented in which a diagnosis of bronchopneumonia could not be made, a definite lobar type of density occurred, more or less demarcated, localized to a lobe, limited by the interlobar fissure, and with the greatest density occurring at the periphery and gradually lessening toward the hilus.

(a) *Pleural Changes.*—In a few cases a pleural reaction was demonstrable. This can, of course, be demonstrated only in the in-

terlobar fissure where any congestion or thickening of the pleural surfaces can be detected, and it is largely due to the fact that the position of the interlobar fissure gives depth to the pleura, and depth with congestion is necessary to give a shadow on the roentgenogram.

### *Abscess*

Wessler, in a well-written article (Lung Abscess and Bronchiectasis, A Clinical and Roentgenological Study of One-hundred Cases. *American Journal of Roentgenology*, April, 1919, vi, No. 4, p. 161) studies the sequence of events in cases of postoperative lung abscess. These most commonly follow tonsillectomy, and only when the patient is fully under the influence of ether. There can be little doubt that these abscesses result with relative frequency from the aspiration of the infected plugs in the tonsillar crypts which are squeezed out when the tonsil is grasped in the forceps.

The lodgment of such a plug in a bronchus gives rise to a pneumonia varying in extent from a small patch up to a whole lobe, with the usual accompanying symptoms. At the point of lodgment of this septic plug, the anaërobic organisms set up a destructive inflammation of the bronchus with the formation of a gangrenous bronchiectatic cavity of varying size. Such a cavity usually lies embedded in the infiltrated lung, and by its presence and the putrid secretions which it engenders maintains a chronic irritation of the lung about it. If the necrotic walls of the cavity slough out and are expectorated, the anaërobic infection dies out. It no longer exerts its irritant effects on the lung; the pneumonia subsides, the lung once more becomes air-containing, and, as it expands, automatically obliterates the cavity.

Such a desired result occurs only in cases of short standing. A persisting irritation soon leads to fibrosis, which brings in its train rigid membranous cavity walls that will not collapse. Such an abscess cavity is no longer capable of spontaneous healing. Sooner or later, the overflow from this cavity will infect neighboring or distant healthy lung tissue, and the disease will take on renewed activity.

Another type is a progressive round-cell infiltration, fibrosis; the terminal bronchioles are strangled, and secondary bronchiectatic cavities develop. Usually these secondary cavities are much smaller and are not visible on the plate. In fact, in the great majority of



the cases only one fairly large cavity is visible on the roentgen plate: on the operating table or at autopsy additional macroscopic cavities and microscopic dilatations of the bronchi are usually found. Such cases can be cured surgically only by eradicating the whole diseased lobe, by a lobectomy, whereas the cases of solitary abscess without infiltration may be effectively treated by incision and drainage.

The roentgen ray affords a convenient and exact method of following the evolution of suppurative lung conditions. In cases of remissions in which the signs and symptoms may be absent, the roentgen examination will always show evidence of disease. More commonly there may be only a small area of pneumonic infiltration which has persisted after an apparent cure. Ill-defined, and inaccessible to ordinary methods of examination, such a focus of disease will flare up under ill-understood, unfavorable conditions, and reproduce a former extensive involvement of the lung. In announcing a cure, therefore, of a lung abscess, not only must the clinical symptoms and signs have subsided, but all roentgen evidence of disease must have disappeared.

The frequent exacerbations which mark the course of many lung abscesses owe their origin to an extension of existing foci of disease. Conditions for their occurrence are most favorable when a large cavity exists full of secretion and communicating with the bronchus. The spilling over or the expulsion of the contents of this cavity in the act of coughing will inundate a near or remote portion of the bronchial tree and thus at a stroke inaugurate a widespread disease.

A second large group of suppurative lung conditions is that which follows pneumonia or influenza, or is a sequel of an attack of bronchitis. In a general way it is possible to distinguish two types of abscess conditions in these cases. In the one the sequence of events after pneumonia is very similar to that encountered in aspiration abscesses. In a second and larger group of cases resulting from pneumonia the patients are usually seen some months after the onset of their illness. They do not appear to become gangrenous until later, and therefore many of them do not exhibit a large cavity. These cases are very insidious and go on to a progressive fibrosis with the development of numerous bronchiectatic cavities. The roentgen observation of such cases is very instructive, because the persistence of fever and cough and the invariable hemoptysis lead to a strong suspicion of tuberculosis or of an encapsulated pleural ef-



fusion. On the roentgen plate one may follow the persisting pneumonic infiltration from its early stages for a period of months and may note a gradual increase in its density, due to fibrosis. Here cavities are rarely visible, as they are small dilatations of the bronchi which are indistinguishable in the general infiltration. If the bronchi become sufficiently dilated and thin-walled, the roentgen plate may reveal a honeycombed appearance of the lung. Single or multiple abscess cavities may develop. The cases just described are conveniently grouped as chronic non-tuberculous lung infections, in contradistinction to cases of tuberculosis which they superficially resemble. Although they are thus frequently diagnosed and are consequently found in sanatoria, it is an easy matter, by means of their characteristic roentgen appearance, to assign them to their proper place.

He then presents a résumé and analysis of 100 cases of suppurative lung disease and some observations suggested by a study of them.

Gray (Some Non-Tubercular Pulmonary Conditions, *American Journal of Roentgenology*, Feb., 1919, vi, No. 2, p. 66), calls attention to certain more or less definite conditions observed in a considerable number of cases in which roentgen examination of the chest was given, usually after a provisional diagnosis of tuberculosis had been made. In most instances there has been an absence of the complete picture of tuberculous involvement, or at least some diagnostic factor is at variance with the rest of the findings.

In the cases examined there has usually been a history of grip, tonsillitis, or even pneumonia of a mild type. Following the acute attack there persists an evening temperature, a rapid pulse-rate, extreme weakness, continued loss of weight and a failure to return to normal, despite an absence of any definite indications of the true location of the cause. There may be very little cough or expectoration, and physical examination may reveal only a few moist râles, slight tubular breathing, or impaired resonance, or these may all be entirely undistinguishable. The sputum, when present, will usually show pneumococci, staphylococci, and streptococci influenza bacilli. There is apt to be a polynuclear leukocytosis, although in one of the cases here reported there was, at times, an absence of polynuclear increase.

Stereoscopic plates will usually show a localized increase in the

size, number and density of the pulmonic markings, without confluence and with diminished illumination.

The condition may be distinguished from:

(1) Abscess, by the absence of a localized area of great density, or the usual appearance of a fluid level in the upright or lateral position with a gas area above.

(2) Lobar pneumonia, by the absence of the dense consolidation of the interstitial lung tissue without the appearance of abscess.

(3) Lobar pneumonia, by the absence of discrete areas of lobular consolidation.

(4) Tuberculosis, by the absence of tubercles or of the characteristic tuberculous mottling.

From observing the course of the cases that he has had the opportunity to follow, the writer is convinced that the condition is either a low grade of bronchitis and peribronchitis due to pyogenic organisms or, in a more developed form, a type of bronchopneumonia, which may run a subacute course for several months and terminate in complete recovery, or may proceed to abscess formation requiring surgical intervention to effect a cure.

*(To be continued)*

## SECTION ON NEUROLOGY AND PSYCHIATRY

LICEN, E.: Concerning Non-suppurative Hemorrhagic Encephalitis. *Zeitschrift für die gesamte Neurologie und Psychiatrie*, 1918, xlii, 1.

The patient, a woman forty years of age, was suddenly seized with a slight paralysis of the left half of the body. At the age of sixteen years she had suffered a trauma as a result of which she had been in a psychopathic condition for a period of two months. The slight palsy of the left lower extremity grew worse, until the limb was fully paralyzed, and there was also a spastic paralysis of the right lower extremity. There were also disturbances of the bladder and bowels, but there was no disturbance of sensibility until the last month of life. The pupillary reflexes were preserved and there was no nystagmus. Four and one-half years after the beginning of the disease, the patient died in a comatose condition.

Syphilis was excluded. Tumor was improbable, because of the insidious course of the disease. By various symptoms, disturbance of speech, difficulty in swallowing, compulsory laughing and weeping, etc., the author was led to make the diagnosis of multiple sclerosis, or of a vascular process. The tendency to remissions in the disease, as well as the persistency of certain symptoms apparently arising from circumscribed foci, and the absence of every optical symptom and of other signs of disease of the brain-nerves, represented a deviation from the usual picture of multiple sclerosis. At the section it was found that the case was one of non-suppurative encephalitis, and the histologic examination revealed localized foci combined with changes of a diffuse character. The presence of lymphocytes, plasma-cells and polyblasts around the vessels and in the tissue was evidence of the inflammatory nature of the process. The

stability of the impairments was the result of the complete destruction of all the nervous elements in the vicinity of certain foci, and of the diffuse destruction of medullary substance in the hemispheres. There were serious secondary degenerations corresponding to these changes in the nervous tissue. The sudden appearance of the defects was due partly to bleeding, a phenomenon discovered at the autopsy in various sections of the central nervous system. In the brain the bleeding was principally in the medullary substance, in the basal ganglia, in the optic thalamus, in the cerebellum and in the radiations of the medullary fibers of the hemispheres. The regions of the brain-nuclei were unharmed. For the most part the bleeding was attributable to degenerative changes in the vessel walls. These special histological observations of the case point to an independence of the inflammatory changes in the vessel apparatus, the destructive processes in the nerve-tissue, and the hypertrophic processes in the glia. Etiologically the disease was in all probability connected with a concurrent nephritis and endocarditis.

S. E. JELLIFFE.

WEDEKIND, A. W.: Contribution to the Discussion of Psychic Infection. *Journal für Psychologie und Neurologie*, 1917, No. 22, p. 185, and No. 23, p. 50.

The author has made a study on six types of groups:

- (1) An epidemic of anxiety in a fortress guard after the suicide of a soldier.
- (2) Induced paranoia by contagion from a daughter to a father.
- (3) Epidemic of religious insanity with incest.
- (4) Epidemic of twitching spasms among the employees in a laundry.
- (5) Contagion of twitching spasms with unconsciousness.
- (6) Schizophrenia in various members of a family.

In the author's opinion, the material here collected proves that purely mental contagion may produce effects which render practically healthy or even entirely healthy persons unfit for work and, under certain conditions, dangerous to associates. A sharp distinction between psychic infection, in the sense used by many writers,



and induced insanity, is not warranted, as the differences are only of degree and not of nature, there being gradual transitions between strong suggestion, the psychic infection of single symptoms, and the real disease of induced insanity. According to Wedekind, greater effort should be applied in the direction of prophylaxis against psychic epidemics. Sources of infection should be immediately removed and treated. For example, upon an outbreak in a factory, physicians in administrative positions should be informed concerning the importance of suggestion on the masses and be given an opportunity to observe simple examples of the effects of suggestion.

S. E. JELLIFFE.

BERZE, J.: Concerning the Question of the Localization of Ideas. *Zeitschrift für die gesamte Neurologie und Psychiatrie*, 1919, xliv, 213.

After an extensive review of what has been offered on the subject by previous neurologists, especially by, Monakow, Lewandowsky, Jaspers, and Goldstein, the author states that absolutely no localization of psychical processes has as yet been discovered. Where the psychical processes (perception) begin, the localized processes (sensory spheres) cease in one direction, and, in the other, the processes can be localized only when the regions of motor innervation are reached. In other words, only the "pre-psychic" and "post-psychic" processes are localized. The objection may be raised that the functional content—i. e., the projection fields—is of a precise psychophysical nature. The "gnosias" and "praxias" are brought forward as evidence that the psychic processes have at least relative localization. The author answers that such views are held because the distinction is not made between the psychic function and its results. In electrolysis one element of a composite substance appears at the anode, the other at the cathode, but no one thinks of asserting that the electrolyzing agent is localized at the two electrodes. That which is stored in the sensory image region on one side and in the motor projection field in the other (comparable to the different elements at the two electrodes), may be said to be localized, but the psyche represents the relation which exists between these two fields. In this sense there is no contradiction in asserting that nothing is known .

concerning its localization. The localizations of the sensory and motor elements will be the more secure and definite in proportion as these two processes considered as objects of research, are separated from the psychic. As for the psychic sphere as a whole, as represented by the cortex, it may be possible in the future to differentiate separate strata in the sense that the content of certain functions belonging to the psychic unity is connected with these definite localizations. But, as yet, there is no evidence of the existence, even, of such differentiations, to say nothing of any knowledge of principle according to which the psychic functions belonging to various strata may be distinguished from each other.

S. E. JELLIFFE.

PAGNIEZ, P. AND NAST, A.: Study of the Pathogenesis of Attacks of Migraine. *La Presse médicale*, Apr. 28, 1920, xxviii, No. 25, pp. 253-254.

Migrainal attacks cannot be produced at will in most cases, but many patients are aware of certain factors which tend to produce an attack. The etiological factor may be the ingestion of certain foods or drinks, the occurrence of muscular fatigue, emotional states, or a disturbance in one's regular mode of life.

A patient exposed to those conditions which he believes will precipitate an attack, does not begin to suffer for some time after the causative agent has been brought into play. Occasionally a whole day may elapse between the cause and its evident effect.

The known etiological factor does not always produce an attack of migraine. Patients are aware of the fact that for certain periods they will be free from attacks, no matter how they act, and that after such times they must be very careful, because a slight indiscretion may produce a violent migraine.

The authors carefully studied a patient who had suffered from migraine since childhood. The important food element which caused his attack was chocolate.

This patient was given chocolate on an empty stomach. This soon produced an attack. On the day on which the patient suffered, repeated examinations of the blood showed the absence of a digestive leukocytosis, with the presence of a leukopenia. Some time elapsed

between the appearance of the blood-picture and the onset of the clinical symptoms. The effect of the chocolate on the blood appeared immediately after its ingestion, the symptoms becoming marked several hours later.

Migraine, then, like the anaphylactic conditions of asthma and urticaria, may be produced at will under favorable conditions. But the causative factor is not always potent. In order to produce an attack, this factor, e. g., the chocolate, must be employed when the patient is in a potential migrainal condition. The patient studied could eat chocolate with impunity at certain times. At such times, there is apparently a desensitization of the patient, which renders the patient immune to the effects of the chocolate. When this immunity disappears, the patient is again sensitized. An attack can now occur, which renders him immune again for some time.

S. KAHN.

FUNK, E. H.: Generalized Neurofibromatosis (Recklinghausen Type). *International Clinics*, 1919, iii, 29th Series, p. 99.

Funk reports 4 cases of this disease, which he observed in the Department of Medicine of Jefferson Medical College in Philadelphia. Two of the cases are of interest on account of a family history of neoplastic involvement. One patient was a twenty-four year old negress whose father died of "tumor of the heart" at fifty-five years of age. The mother died of cancer of the left breast at forty-five. Two brothers died of cancer of the "right side" at twenty-one and twenty-five years respectively. One sister died of cancer of the scalp at seventeen years and twin sisters died of "blood tumors in the abdomen". Their ages are not known. One sister (twin of the patient) died of cancer (?) of the left breast at the age of seventeen. The mother and twin sister suffered from multiple skin tumors (neurofibromata) resembling those of the patient.

Another one of his cases was a white male twenty-four years old whose family history reveals that the father, aged sixty years, and four sisters have skin tumors.

After describing the cases in more or less clinical detail with the histological findings from the tumors which were obtained by biopsy in the case of 2 of the patients, he discusses neurofibroma-

tosis in general and concludes the paper by summarizing our present knowledge of the subject as follows:

(1) Cutaneous neurofibromatosis (Recklinghausen) is only a form of generalized neurofibromatosis. (It may occur alone or in association with other forms, deep-seated neuromata, plexiform neuromata, elephantiasis neuromatosa, etc., etc.)

(2) It is usually associated with pigmentation of the skin, and not infrequently with evidences of mental deficiency.

(3) Its cause is unknown; there is, however, strong evidence to suggest a developmental abnormality, and an hereditary or familial tendency to the disease is frequently demonstrable.

(4) It is a system disease, in that the lesions are limited to the nervous system. The involvement is usually peripheral, but may also be central.

(5) It is characterized, pathologically, by tumor formation showing the characteristics of a fibroma, and originating from the connective tissue portions of nerves, i. e. the endo- and perineum. Like all fibromata they may become malignant.

(6) It is not amenable to any known form of treatment. Individual tumors producing symptoms may be treated surgically.

M. KESCHNER.

BRUCH, A.: Researches Concerning the Sensitiveness to Alcohol of Individuals with Brain Wounds. *Journal für Psychologie und Neurologie*, 1919, No. 24, p. 53.

This is an account of an experiment with 19 individuals with brain wounds, and with 5 normal individuals as controls. The test used was the addition of numbers of one place according to the method of Kraepelin. The summary of the results is as follows: The inhibitory effect of 13 grams of alcohol was much greater on the wounded individuals than on the others. In some cases, the performance was one-fourth less than when no alcohol had been taken. The initial exciting effect of the alcohol was very perceptible in the case of those patients who were able to perform mental tasks, but who were lacking in volitional initiative, the alcohol acting as a spur to replace the deficient will-force. In general, the well-known change



from the initial exciting to the paralyzing effect was more apparent than in normal persons. Repetitions of the alternating periods of excitement and paralysis after a single administration of alcohol was a noteworthy characteristic in these patients. The early appearance of the paralyzing effects may be regarded as evidence of extreme susceptibility to the effects of the alcohol. There was a positive correlation between the mental fatigability and this susceptibility, which has probably sufficient generality to permit its use in making judgments concerning nervous and pathological borderline cases.

S. E. JELLIFFE.

HEAD, H.: The Elements of Psychoneuroses. *British Medical Journal*, March 13, 1920, No. 3090, p. 38.

Most of the defects arising from the war have been removed by treatment. Those which remain are of the poor mentality type, and consist largely of states of anxiety and obsessions. These psychoneuroses should be regarded as a disturbance of function, common both to the nervous system and to the mind. The form which they assume depends upon the personality of the patient, and upon the nature of the emotions and ideas with which he has to deal. Such expressions as "shell shock" and "neurasthenia" do not correspond categorically with the manifestations of the functional neuroses, which are in reality the forms assumed by the reaction of the patient to his individual mental experience.

L. C. JOHNSON.



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# INTERNATIONAL MEDICAL DIGEST

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## SECTION ON GENERAL MEDICINE

LEWIS, T.: On Cardinal Principles in Cardiological Practice.  
*British Medical Journal*, Nov. 15, 1919, No. 3072, p. 621.

The idea of dividing heart disease into either organic or functional lesions has gained ground beyond reason, and no longer occupies the place proper to classification, since the one is accepted to mean a serious affection, and the other, a trivial one. Not all instances of structural change are serious, whereas those classified as functional are often far from trivial. Many cases, because of this classification, are considered cardiac, when they are not cardiac at all. Of the valvular lesions, there are but two common ones the finding of which will repay the general physician for the expenditure of much time and thought: incompetence of the aortic valve, and stenosis of the mitral valve. It is the habit of each lesion to present signs of an unequivocal nature. These conditions may be diagnosed with confidence, and if we know that they exist, we know of the extra burdens which the heart must carry, and that the heart as a whole has suffered damage. One of the surest ways of diagnosing a faulty myocardium is to diagnose these conditions. The signs of cardiac failure are: the early evidences of impaired circulation, evidenced by fatigue leading to exhaustion, breathlessness, and pain on exercise; the signs of cardiac enlargement, and its degree, whether hypertrophy, or dilatation; signs of valvular disease; the presence or absence of fibrillation of the auricles; the evidence of infection; and the etiology of this infection. No person possessing a normal capacity for exercise has grave heart disease, and the above are the

cardiac points in diagnosing cardiac disease. The general principles of treatment have to do with the regulation of the heart's work and rest. A cardiac patient is unfit to be on his feet, if, when up, he becomes breathless, has cardiac pain, or quickly tires; and if the patient is breathless when in bed, he is gravely ill. After a period of rest, the whole life of the patient should be so ordered that he never exceeds his cardiac reserve.

L. C. JOHNSON.

MACLACHLAN, W. W. G.: The Medical Treatment of Aortic Aneurysm. *American Journal of Medical Sciences*, 1920, clix, 522.

Syphilis produces in the wall of the aorta a granulomatous inflammation extending from the adventitia into the media and intima, with a variable amount of gummy necrosis in the wall. According to the author "aneurysm" really signifies a chronic progressive and active syphilis of the aortic wall. The author outlines the medical treatment of 3 cases of aneurysm which showed improvement after a period of from fourteen months to three years:

(1) Rest. As soon as the diagnosis is made, the patient is kept in bed for at least three months, being allowed to get up only to go to the toilet. For the next nine months he is limited in his physical work. Mental and physical rest should be the basis of treatment for the remainder of the patient's life.

(2) Light diet, the fluid intake being moderately limited.

(3) Antiluetic treatment. This should be continued long after the Wassermann reaction is negative—Arsphenamin, mercury and potassium iodid should be given in large amounts.

M. H. KAHN.

LUTEMBACHER, R.: Aneurysm of the Left Ventricle. *Archives des maladies du coeur*, 1920, xiii, 49.

The symptoms of aneurysm of the heart are not distinctive from the symptoms of the cardiovascular disease in the course of which it develops. The author reports two cases in both of which two clinical features stand out as significant.

One case showed mitral regurgitation clinically in a man of 37 with rapidly developing cardiac failure. Radioscopic examination showed a marked hypertrophy of the left ventricle which could not entirely be accounted for. Two clinical features stood out prominently. One was severe precordial pain in the region of the apex beat. The other was evident pericardial adhesion localized to this region. The autopsy showed an aneurysm of the apex of the left ventricle, surrounded by pericardial adhesions. The entire myocardium of the apex was replaced by fibrous tissue and adherent to the diaphragm. The papillary muscles were thus held fixed, preventing mitral closure. The left ventricle was much dilated, but there was no other valvular lesion. In the anterior coronary artery there was a small patch of endarteritis partially obstructing its lumen. The aorta, systemic vessels and the kidneys were otherwise normal.

The second case was of a man fifty-four years of age, who had signs of cardiac failure, associated with precordial pain in the region of the apex and muffled sounds on auscultation. The *x*-rays showed a wide heart shadow and diaphragmatic adhesions, especially of the left ventricle. The autopsy revealed an enormous aneurysm of the left ventricle, itself about the volume of the heart. Pericardial adhesions fixed the apex to the diaphragm and the aneurysm lay in a hollow on the upper surface of the diaphragm and the liver. The wall of the aneurysm was thin and fibrous. Its cavity was filled with fibrinous clots. The left ventricle was dilated but the valves were normal. The aorta and coronaries showed marked atheromatous changes and the lumen of the anterior branch of the coronaries was obliterated by a fibrinous clot. There was pulmonary edema and interstitial nephritis. The liver was pushed down by the aneurysmal mass above it.

Aneurysms of the left ventricle do not tend to point outward through the costal frame. They tend to gravitate to the upper surface of the diaphragm and liver. The especially significant signs follow: Localized pain at the apex of the heart, intense and persistent to the end; pericardial adhesions in the region of the apex evidenced especially by fixation or absolute immobility of the apex without systolic retraction, and rapid development of cardiac failure with a mitral murmur and extreme dyspnea. Aneurysm of the left ventricle develops suddenly, apparently without basis in the previous cardiac signs, progresses rapidly, and with a gravity out

of proportion to the extent of the pericardial adhesions. This might suggest myocardial destructive changes.

M. H. KAHN.

MARTINET, A.: The Treatment of Angina Pectoris. *La Presse médicale*, Feb. 25, 1920, xxviii, No. 16, pp. 153-154.

Before treating a patient suffering from angina pectoris, one should determine the following important elements:

- (1) Anatomic element:
  - (a) Aortic lesions—aortitis, insufficiency.
  - (b) Coronary disease.
  - (c) Myocardial disease.
- (2) Physiopathologic elements:
  - (a) Distention of the periaortic plexus and its branches.
  - (b) Myocardial ischemia.
  - (c) Cardiac insufficiency.
- (3) Etiologic elements:
  - (a) Syphilis.
  - (b) Gout.
  - (c) Obesity.
  - (d) Rheumatism.
  - (e) Arteriosclerosis.
  - (f) Neuropathies.
- (4) Exciting Causes:
  - (a) Hard work, especially after meals.
  - (b) Emotion.
  - (c) All excesses.
  - (d) Digestive disturbances—meteorism, aerophagia.

#### TREATMENT

- (1) Remove the exciting cause:
  - (a) Interdict tobacco, alcohol and coffee.
  - (b) Give an appropriate diet to prevent the digestive disturbances.
  - (c) Avoid hard work, and excesses of all kinds.
- (2) Treat the predisposing cause:
  - (a) Specific treatment of syphilis.



- (b) Eliminative treatment in gout, rheumatism and plethora.
- (c) Sedative and suggestive treatment in nervous patients.
- (3) Treat the physiopathologic condition:
  - (a) Elimination in plethora.
  - (b) Sedative in pain.
  - (c) Antispasmodic in arterial spasm.
  - (d) Nitrites in coronary disease.
  - (e) Digitalis in cardiac insufficiency.

In treating a case of angina pectoris, two distinct stages should be recognized:

- (1) Treatment of the attack.
- (2) Treatment between attacks.

#### *Treatment of the Attack*

- (1) Sedative and antispasmodic hypodermic injection of morphin and atropin.
- (2) Cardiotonic—77.16 grains (5 grams) of camphor in oil.
- (3) Sinapism to entire chest, until skin becomes red.
- (4) Hot applications to arms and forearms.
- (5) Inhalation of amyl nitrite, which affords temporary relief and gives time for the other therapeutic agents to become active.
- (6) Phlebotomy for active pulmonary edema and cardiac dilatation.

#### *Treatment Between Attacks*

This depends upon the cause of the disease.

(1) Since some cardiac insufficiency is usually present, digitalis gives very good results, in small doses when given for ten days during a month:

- (a) Crystalline digitalin                      1/10 mg. (.00154 grains)
- (b) Digalen                                      5-8 minims (0.30-0.50 c.c.)
- (c) Digifolin                                    5-10 cg. (.7715-1.543 grain)
- (2) Treat associated arteriosclerosis and cardio renal disease.
  - (a) Rest.
  - (b) Limited diet.
  - (c) Diuresis by theobromin.

(3) If syphilis be present, intensive mixed treatment should be instituted.

(4) Treat associated plethora, gout, angiospasm. The restriction of fluids is of great importance. A restricted diet is of great aid. Food should be given in small quantities at frequent intervals, rather than in large amounts two or three times daily.

(5) The administration of iodid is a routine measure. The preparations of valerian are useful.

(6) Regulated, progressive exercises are of value in some cases.

(7) It is well to give the patient some medicine, which he can have with him always, and which he should take when the very first manifestations of an attack become felt. The dose given by the author usually contains:

Ammonia acetate	4 grains (0.26 gram)
Cognac	20 minims (1.25 c. c.)
Syrup of ether	40 minims (2.50 c. c.)

S. KAHN.

WHITE, P. D.: A Case Showing Apparent Paradoxical Respiratory Arrhythmia of the Heart. *The Boston Medical and Surgical Journal*, May 20, 1920, clxxxii, No. 21, p. 531.

A man twenty-three years of age, with history of typhoid five years previously and severe double pneumonia at age of five, since which time his pulse has been slow, was seen at Base Hospital, No. 6, in 1918. He was convalescing from influenza and his heart was negative except for slow rate. The following table shows the auriculoventricular rates under different circumstances as determined by polygrams taken with the Jaquet polygraph.

	Auricular Rate	Ventricular Rate
Quiet in bed	43	43
Quiet in bed (Later)	40	40
During deep inspiration	70	35
Deep expiration	41	41
Immediately after moderate exertion	72	36

Ordinarily the heart-rate is increased with inspiration and exercise. Here the opposite was the case. This paradoxical condition was due to the occurrence of a 2 to 1 heart block when the auricular rate rose above a certain point. His auriculoventricular junctional tissue was depressed probably by some disease in early childhood so that beyond a certain point it fails to transmit every other auricular impulse. Actually, the pace-maker of the heart did respond normally to respiratory influence and exertion, but the block produced this unusual finding of slowing during inspiration and expiration. During the slow rate the auriculoventricular conduction time was normal. Two similar cases are given in literature. The author concludes that the apparent paradox is due to the production of heart-block by increase of auricular rate plus depressed auriculoventricular conduction.

M. M. BANOWITCH.

COLBERT: Hypertension in Tuberculosis. Abstracted in *Archives des maladies du coeur*, 1920, viii, 9.

Hypotension is the rule in active tuberculosis. With improvement in the primary condition the tension returns to normal. Colbert encountered 15 cases of hypertension in 300 tuberculous individuals. He was able to exclude diabetes, obesity, cardiorenal disease, syphilis, etc., as causes of the high pressure. In these cases, the systolic pressure rose as high as 250 mm. of mercury and the diastolic pressure reached 110 mm. The author attributes the hypertension to vasomotor disturbances due to the specific microbic poison.

M. H. KAHN.

DEMEYER: Action of Physostigmin on the Heart. *Congrès français de médecine*, xiv; reviewed in *La Presse médicale*, June 5, 1920, xxviii, No. 37, p. 366.

The injection of small doses of physostigmin ( $11\frac{1}{2}$  mgm.) causes a rapid and marked fall in the pulse-rate. This action manifests itself in all varieties of ordinary tachycardia, in paroxysmal tachy-

cardia, and in auricular fibrillation. The administration of the drug is without danger. Its action can also be obtained when the drug is given *per os*.

S. KAHN.

MURPHY, G. B.: Rupture of the Left Cardiac Ventricle. *Canadian Medical Association Journal*, Nov., 1919, ix, No. 11, p. 1019.

Murphy calls attention to the great rarity of the condition. The majority of cases reported appeared in patients over sixty years of age, although it has occurred in infants, following embolic infarction of the left ventricle. The case reported is of interest because it occurred during absolute rest in bed, and because the patient had no precordial pain except at the instant of rupture.

Murphy's patient was a Methodist minister fifty-eight years old, 5 feet, 9 inches tall, weighing one hundred and seventy-three pounds. Except that one of his brothers, who died at the age of sixty-two, had suffered from some form of heart disease, the family history was negative. The patient himself had measles at five, a fractured leg some years ago; sixteen years ago he had a fainting spell following some unusual exertion. He never had rheumatism.

The present illness began, two days before he came under observation, with pain in the region of the stomach; this pain was attributed by the patient to some indiscretion in diet. No other symptoms were present. Calomel was administered and a light diet ordered. He was comfortable during the night, and on the next day began to suffer from dull pains in the lumbar region. At that time the temperature was 100° F. (37.78° C.), the pulse, 72 and regular. The tongue was coated. The heart-sounds were clear; there were no murmurs; the left border extended slightly beyond the nipple line. The arteries were not palpable, and did not appear thickened. The blood-pressure was not taken; the author thinks "it could not have been beyond 140." The lung findings were negative. The abdomen was slightly distended, and although there was some rigidity of the right rectus abdominis there was no tenderness. The liver was normal. There was no edema. The urine, except for the presence of a few erythrocytes, was normal. The patient's condition was about the same on the next day, except that the tempera-



ture was 97° F. (36.11° C.) and the pulse 78. There was no dyspnea. The day following, the patient felt so well that he wanted to get out of bed. His temperature was 99° F. (37.22° C.), pulse 88, soft, regular, and of good volume. The heart-sounds were clear. There was abdominal rigidity, which persisted. The urine showed a marked trace of albumin. At two p. m., against advice, he took a warm bath. An hour later he began to have twinges of pain in the lower anterior chest; these disappeared after the application of a hot water bottle. He read aloud about six p. m., and at seven p. m. called for his son to come up. Nothing unusual was noticed in his condition at this time, but in a minute or two he convulsively grasped his precordial region and died.

Postmortem exploration of the chest only was permitted. The lungs were pale and partially collapsed. Inspection of the pericardium showed nothing unusual, but when the sac was opened a large quantity of bloody fluid escaped, and before the heart could be reached, a blood-clot, the size of a double fist, was removed. The aorta and other great vessels were collapsed and their walls flattened. On removing the heart a clot was found in the pericardial sac which would easily have filled a pint measure. The heart revealed an unusual amount of fat. The heart-muscle was pale and flabby, and the entire organ somewhat contracted. On the most prominent part of the anterior curve of the left ventricle there was a vertical tear in the muscle-wall about  $1\frac{1}{4}$  inch long and about 1 inch from the interventricular septum. The edges of the tear were deeply blood-stained, and the adjacent tissue darkened. A probe could easily be passed through the tear into the ventricle. When the organ was opened nothing abnormal was found in the right auricle or ventricle. Both cavities were empty of blood. The same was true of the left auricle. A few small clots were to be seen behind the cusps of the mitral valve. The left ventricle was greatly hypertrophied ( $2\frac{1}{2}$  cm.), very pale, and extremely pliable. In the region of the rupture the muscle was not thinned out. The tear was of the same size on the inner aspect of the ventricular wall. This chamber was also empty of blood. The aortic valves were sclerosed at the base of the cusps, and there were many atheromatous patches in the root of the aorta. The coronary arteries were also sclerosed, but showed no thrombosis or embolism.

M. KESCHNER.

MONCKEBERG, G.: Sclerosis of the Arteries (Über Arterienverkalkungen). *Münchener medizinische Wochenschrift*, March 26, 1920, No. 13, p. 365.

Lobstein first concluded that sclerosis of the arteries was due to nutritional disturbances. Virchow considered it of inflammatory origin. Marchand first coined the name of atherosclerosis (degenerative internal change).

The intima is produced by elastoblasts which deposit the elastic tissue. These suffer, when overtaxed, and degenerate. There can therefore be no replacement of worn-out elastic fibers. The intima also contains fibroblasts which secrete a collagenous substance to compensate for the loss of elastic substance, and to strengthen the intima. Over-distention is thereby prevented. If tension is overcome, stretching follows, elasticity is lost and the vessel becomes a rigid tube. Fatty changes follow. Plasma enters between the intimal cells; the fat becomes split into fatty acids which combine with the calcium to form soaps. In the larger arteries the process begins in the intima, and in the smaller arteries in the media. Muscle fibers undergo fatty degeneration with fibrosis and calcification. Early calcific deposits may be demonstrated by the x-rays. In medium-sized arteries confluence of patches may produce a trachea-like appearance.

Hornowski speaks of endatherosclerosis and mesatherosclerosis. In the former there is hypertrophy and hyperplasia followed by necrobiosis and calcification; in mesatherosclerosis, there is never hypertrophy of the muscularis. The process is degenerative from the beginning, and due to general nutritional disturbances. Adrenalin produces mesatherosclerosis. Cholesterolin produces endatherosclerosis. Both forms may be combined.

H. JOACHIM.

BINET, L.: The Practical Uses of Ocular Compression. *La Presse médicale*, August 21, 1919; abstracted in *Archives des maladies du coeur*, 1920, xiii, p. 7.

The oculocardiac reflex shows itself by circulatory, respiratory and motor effects.

(1) *Circulatory Effects*.—Ocular compression generally shows

the pulse. Weil has shown that in cases presenting extracardiac murmurs with tachycardia, showing of the pulse will eliminate the murmur. This may be accomplished by pressure on the eyeball. An attack of paroxysmal tachycardia can be arrested by this procedure. In cases of headache due to cerebral congestion, pressure on the eyeball may give relief, because it has a vasoconstrictor action on the cerebral vessels, which action diminishes the amplitude of the cerebral pulse.

(2) *Respiratory Effects*.—Ocular compression will tend to arrest the breathing in inspiration, or, according to the degree of compression, will slow the respirations and increase their depth. It is therefore indicated and is found beneficial in cases of asthma.

(3) *Motor Effects*.—Compression of the eyeball tends to arrest chills, such as occur at the onset of infectious diseases. The tremor of exophthalmic goitre and athetoid movements of epileptiform movements of certain neuropathic cases are also favorably influenced.

(4) *Effects in the Eye Itself*.—Bailliert, while practicing ophthalmoscopy, found that compression of the eyeball will affect the retinal arteries. By measuring with a manometer the amount of compression needed, he estimated that the maximal pressure in the central artery of the retina was 86 mm. of mercury and the minimal pressure 67 mm.

M. H. KAHN.

WARNER, A. R.: Future Tasks and Problems of the American Hospital Association. *The Modern Hospital*, Oct., 1919, xiii, No. 4, p. 255.

It is the duty of this association to review carefully and critically its organization, traditions and methods, and to consider thoughtfully all possible lines of usefulness in order to recognize in time opportunities for service and to keep the internal machinery adapted and adequate to the position it can and should hold to-day.

The change made in the constitution a year ago, which provides for institutional membership in addition to individual membership, has met with a hearty response in the enrollment of 208 hospitals with 624 representatives qualified to vote. This number is growing steadily. With this new feature come new responsibilities, however.



According to the old constitution, and in keeping with the idea of individual memberships, there was no service further than an annual conference and a printed report giving in detail the discussions advanced at that time. But, under the new constitution, the points of service have been increased; and, now, in order that the American Hospital Association may render the constituent hospitals a positive service of practical usefulness, the trustees of the Association have approved a general policy of service bureaus.

So far only one service bureau has been definitely established. This covers dispensaries and the community relations of hospitals. For this the part time service of Mr. Davis, director of the Boston Dispensary, has been secured. For advice or discussion of plans by correspondence the services of Mr. Davis are absolutely free to the institutional members. If it is mutually agreed that Mr. Davis conduct a personal investigation on the grounds, the only costs are the actual travelling expenses. The personal services of Mr. Davis are provided by the Association.

One service bureau is only a beginning. The establishment of an employment bureau for the finding of suitable persons for vacant positions in hospitals and suitable positions for members of the association out of employment should come next. During the past year the secretary has done a considerable amount of this work informally. Such a bureau will become progressively more efficient with the volume of work.

The development of state and sectional hospital associations with definite arrangements for the affiliation of all these groups is important. A plan of composite membership could be arranged so that all who are members of the state associations would become, automatically, members of the national association. Such plans have been rendered successful in medical and other associations by providing a continuous membership.

The work of the health officer, the medical college, the nurse, the medical social worker, the state industrial and other forms of health insurance, together with many forms of private philanthropy, institutions and persons all working, as best they can, individually, for the common good, could be organized to much better purpose. There is a general determination to accomplish a coördination, a betterment of conditions, as well as a general belief that lines formerly considered permanently established will be re-drawn. The health



program of this country will not merely be amended, it will be entirely re-written in the near future. The common problem is to provide better health for all the people and to reduce the number of unnecessary and untimely deaths. The hospitals are vitally interested in the general health program which is now developing because the work of the hospitals must be fundamentally affected by it. The hospitals of Ohio learned a severe lesson through the enactment of the Ohio industrial insurance laws. While these laws were under discussion and amendable the hospitals gave them no attention. There is nothing to do now but to put up with their unsatisfactory and unjust provisions. At the present time changes in public health laws and programs are under discussion in every state. Is the voice or view-point of the hospitals heard in these discussions? Are the laws being drawn with consideration either of existing hospital conditions or of standards which should be required and established? The association requires, among other things, a service bureau on legislation.

The meeting of the American Hospital Conference indicates the present determination to make a beginning at once on the problem which has come to be called "hospital standardization". A common conviction has been growing that the working out of minimum acceptable hospital standards, as well as the development of hospital ideals, is a problem which is important before all others. The modern hospital is a decidedly complex institution, existing to render a broad but definite service to society, and has many interests at stake. The institution and the idea of service must outweigh the interest of any group of individuals. Many sources contribute to the hospital as an institution—the medical and nursing professions, trustees, social workers, executives and helpers of many kinds; others contribute financial support and others moral support and interest. The blending of all these contributory sources gives the institution its working power. Every department of the hospital affects the results from the work of every other department. It is impossible to have in the same hospital good medical work and poor x-ray or laboratory work, good surgery and poor nursing, good nursing with poor professional work, and so on. A part can never standardize or elevate, disproportionately, the whole, but it can readily depreciate other parts through its own defects. The elevation of hospital ideals and minimum standards must be a general development with

the full and whole-hearted participation of every functioning part. On these principles the American Hospital Conference was formed of two representatives from each of twelve national organizations representing men and women participating directly in hospital work and development. Other organizations will undoubtedly be added. All institutions will be standardized, for new and sufficient public opinion seems to be accumulating to render effective and rigid the accepted decisions, minimum standards and ideals.

B. H. ANTHONY.

CROW, W. D.: The Question of Fire Hazards in Hospitals. *The Modern Hospital*, Oct., 1919, No. 4, p. 265.

In spite of all that has been said about adequate fire protection, great potential danger still exists in many hospitals. Those persons responsible for these conditions, which remain unimproved year after year, may be lulled into a feeling of security against fire by the argument that there is no time of the day or night where nurses are not on duty, ready to cope with any emergency, including fire. It must be realized, however, that nurses are not on duty in cellars, attics, boiler rooms, kitchens, and many other parts of the hospital where fire may gain headway before it is discovered.

Statistics on fires, collected by one of the prominent foundations, show an average of two fires a week in hospitals. Such fires, especially small ones, are given as little publicity as possible. Fortunately no great loss of life has occurred, but this does not prove that all precautions should not be taken to prevent such loss.

The hazards to a hospital building may be from without or from within. The presence, as in one extreme case, of a carriage-painting shop next door to a frame hospital building is a decided hazard. Stucco on the exterior of this building, together with a non-combustible roof, would aid in protection. A masonry building near such a source of danger should have fire-resisting and self-closing windows installed.

Kitchens, laundries and high pressure boilers should not be located in the same building with patients, nor should paints, paint stores and inflammable liquids be allowed there.

Electric wiring is a special source of danger if it is old and of

the "knob and tube" design which is used too frequently because it is cheap. Even good electric work, properly inspected when it is installed, becomes a menace if it has been altered by mechanics about the hospital.

The ideal hospital is, of course, a fire-proof building, that is, one in which a fire, if it does start, is confined to the space where it started. Any building not fire-proof should have patients only on the ground floor, from which they can be quickly evacuated. Speed of removal is the greatest factor in a fire. It may be safest to move the patients out of doors, but with the usual staff, and especially at night, it is doubtful whether, with a rapidly spreading fire, this moving can be accomplished in time. Temporary places of safety may be secured by building fire walls from cellar to roof so that each floor is divided into two or more sections. Any one of these sections should accommodate all the patients on any floor on mattresses, for bed patients must be so handled. Communication between these sections should be by large single fire-proof doors, held shut by three-point latches. They should be shut normally, and should be provided with springs or checks to keep them shut, for an open door is not a first-stop. Double-acting doors are bad, for they may be blown open by the strong draft created by a fire.

Every route for fire, such as dumb-waiters and elevator shafts, should be made fire-proof, to prevent the spread of fire from floor to floor. Every stairway should be a thoroughly fire-proof enclosure, which also prevents the spread of smoke. Such stairs should have direct communication with some place out of the building and should have an easy rise, with sufficient width to permit the carrying out of patients on stretchers or mattresses. Ordinary fire-escapes are utterly useless, as one may prove by trying to carry an empty stretcher down one. Such fire-escapes often cross windows, where fire soon renders them useless.

Each hospital should have a fire-fighting equipment to cope with a fire at the very beginning. A good extinguisher is the small, chemical one, to be worked by hand. Such extinguishers should be small enough to be handled easily by the nurses, and should be distributed plentifully about the hospital, so that no time may be lost. If sufficient water pressure is available, stand-pipes and fire-hose should be provided. Automatic sprinkler systems are most useful devices, especially in cellars, store-rooms and attics.



When buying any fire apparatus or fire-proof building material one should insist upon having it "under-writers labeled".

Fire-alarm systems should be installed throughout the building, so that an alarm is sent not only to the fire-department but simultaneously to all parts of the hospital, nurses' home, servants' quarters, etc., from which assistance can be quickly obtained. The alarm bells in patients' corridors and wards should be low-toned, and not alarming, but should have a characteristic sound familiar to all employees. Fire-drills should be held quietly but frequently, so that all concerned may know their posts and duties, thus avoiding confusion in time of danger.

It is earnestly recommended that any necessary improvement in fire protection take precedence over an increase in the endowment fund, extension of the hospital, the acquisition of a new ambulance, or any other cherished project.

B. H. ANTHONY.

MIGNON: Tonsillar Cough. *Congrès de la Société française D'Oto-Rhino-Laryngologie*. xxxii; reviewed in *La Presse médicale*, May 29, 1920, xxviii, No. 35, p. 345.

Coughing due to some tonsillar lesion is very common, but its origin is often unrecognized because the lesion may not be evident. A patient whose cough is apparently inexplicable, should be examined for tonsillar cryptic discharge, adhesions, calculi, encysted secretions, any one of which may be the etiologic factor in coughing.

Treatment, appropriate for the condition found, quickly relieves the patient.

S. KAHN.

LOWREY, L. G.: The Technic of Lumbar Puncture. *The Boston Medical and Surgical Journal*, May 6, 1920, clxxxii, No. 19, p. 479.

Properly carried out lumbar puncture is a painless procedure. The main points are coolness, exact anatomical knowledge, careful direction, and the coöperation of the patient. The lateral position



is preferable as thus anatomical landmarks are easily recognized. Absolute asepsis is necessary as to instruments and utensils and the selected portion of the patient's back. The needle should be sharp and flexible. The author recommends the one devised by Leshinsky of New York. It is made of nickel alloy. The site of election is between the third and fourth vertebræ, although the second and fourth spaces may be used with safety. One must be careful to find the middle line and to allow for spinal curvature if any exists. Not more than 10 c.c. of the fluid, except in cases to be treated, should be withdrawn. The after-care necessitates that the patient rest in bed flat on the back without a pillow. Discomfort after lumbar puncture is rare in paretics or other cases of neurosyphilis. Patients with normal meninges often have headache, and sometimes nausea and vomiting, particularly if they have not been quiet in bed or if an excessive amount of fluid has been withdrawn.

M. M. BANOWITCH.

CHEINISSE, L.: Pepsin Applied Externally as a Therapeutic Agent.  
*La Presse médicale*, May 22, 1920, xxviii, No. 33, p. 325.

The skin is a poor pathway for introducing drugs into the body. The horny layer, especially, is impermeable.

Unna has employed a method of treatment which depends upon the partial "digestion" of the horny layer of the skin by a mixture of pepsin and hydrochloric acid. The cells of the *stratum corneum* are composed of three varieties of albumin, each of which reacts differently to the mixture used. The outer membrane is composed of an absolutely indigestible keratin. The contents of the cells consist of two varieties of albumin, one partially, and the other easily, digestible. With the use of the pepsin-hydrochloric mixture, each cellule becomes hollowed interiorly, and ultimately osmosis occurs through the external membrane.

Unna has found that this mixture is valuable in the treatment of keloids and adherent cicatrices. It may be used in wet dressings, or as a paste, or it may be given by injections for the removal of deep scars.

For wet dressings, the following is a valuable formula:

Pepsin 10 grams (154.32 grains)

Hydrochloric acid

aa 1 gram (16 minims)

Carbolic acid

Distilled water qs. ad 200 grams (6.76 fluid ounces).

Amend has treated chancres by this method, and has obtained good results. Patzschke used it in the treatment of pathological hyperplasia of the lymphoid tissue, and found it useful. It is of value, also, in the treatment of buboes before they suppurate.

S. KAHN.

DUFOUR, H.: Epidemic Hiccough. *Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, Feb. 20, 1920, xxxvi, Nos. 5, 6, 7, pp. 263-264.

The author has seen many cases of hiccough, three of which were associated with fever. The condition may be preceded or followed by sore throat, febrile phenomena, general malaise—and is usually called "Grippe". After the hiccough had disappeared, one patient had twitching of the extremities, a polynuritic psychosis, and torpor which terminated fatally. This leads the author to believe that this condition bears a relationship to lethargic encephalitis, the catatonias, neuritis and myoclonia.

Probably the hiccough is due to some involvement of the phrenic nerve. The duration is from one to four days. The hiccough disappears spontaneously, or after antispasmodic treatment and gastric lavage.

S. KAHN.

SCHOLTZ, M: Clinical Interpretation of Scarletoid Rashes. *New York Medical Journal*, Feb. 21, 1920, cxi, 325.

Scholtz advances the following views on the interpretation of scarlatinoid rashes:

(1) The scarlet fever rash is not a well-defined and distinct der-

matological entity and cannot be distinguished from the rest of the scarlatinoid rashes; it is merely a specific type of tonic scarlatinoid erythemata.

(2) Scarlatinoid erythema is not an independent clinical entity, but merely a symptomatic erythema produced by all varieties of systemic toxins.

(3) The differentiation of scarlatinoid erythemata cannot be made on purely dermatological grounds, but essentially on the associated clinical symptoms and the mode of development.

(4) Nosologically scarlatinoid erythemata should be considered as an erythematous type of the generic group of erythema multiforme.

M. KESCHNER.

GRAFE, E.: The Recognition of Adipositas Dolorosa (*Zur Kenntniss der Adipositas dolorosa*). *Münchener medizinische Wochenschrift*, March 19, 1920, No. 12, p. 339.

This disease is rare in Germany. It is characterized by tenderness of fatty deposits, asthenia, and nervous and psychic disturbances. It affects females only. Metabolic studies showed an increased water retention and a diminished respiratory quotient (0.78 q.). Thyroidin, oöphorin, and hypophysin increased the water excretion and produced a loss of weight. Fatty deposits became less painful.

The author concludes that the painful areas are due to a tension of the fatty tissues produced by water retention.

H. JOACHIM.

DISCUSSION BY THE SUBSECTION OF PROCTOLOGY OF THE ROYAL SOCIETY OF MEDICINE: Diverticulitis. *British Medical Journal*, Jan. 17, 1920, No. 3081, p. 82; also, Jan. 24, 1920, No. 3082, p. 115.

The term diverticulitis signifies any inflammatory changes in the false diverticula of the large bowel, usually in the sigmoid region. They may be very minute, and the apertures lead into the appendices

epiploicæ; later they tend to enlarge, harbour fecal material, ulcerate, perforate, adhere to other structures, and form fistulæ, and about the diverticulum there may be tremendous hyperplasia simulating tumor, or causing stenosis of the bowel. The symptoms include inflammatory trouble, more or less acute in the left lower abdominal quadrant. They frequently simulate those of carcinoma, but there is absence of wasting, the tumor may form and disappear, and blood is absent from the stools. There is a long history of pain in the left lower quadrant, and not infrequently there is a vesical fistula. The demonstration of these diverticuli by the x-ray is always possible, and the treatment is surgical.

The aim of the discussion is to establish the condition as a disease entity, to indicate the points in diagnosis, and to encourage further observations and study.

L. C. JOHNSON.

RAMOND, F.: Pylorospasm. *La Presse médicale*, May 5, 1920, xxviii, No. 28, pp. 273-275.

DEFINITION.—Pylorospasm is an exaggeration of the normal functioning of the pyloric sphincter.

ETIOLOGY:

(1) *Local*.—It is most frequent and most important.

- (a) Mild gastritis.
- (b) Pyloric ulcer.
- (c) Pyloric stenosis following ulceration.
- (d) Pyloric neoplasm (rarely causes spasm).
- (e) Acute and chronic peripyloritis—frequently with adhesions to the gall-bladder and liver.
- (f) Gastropptosis with displacement of the pylorus.
- (g) Poor mastication and food in too great amount.
- (h) Hyperchlorhydria.

(2) *Reflex*.—This is produced by any painful abdominal disturbance.

- (a) Extra-pyloric gastritis and gastric ulcer.
- (b) Cholelithiasis.
- (c) Renal calculus.
- (d) Pancreatic calculus.



(e) Appendicitis.

(f) Any inflammation of the peritoneum.

(3) *General*.—Spasmophiloid states—in which any emotion results in sphincteric spasm.

(a) Neurasthenia.

(b) Vagotonia.

(c) Exophthalmic goiter.

(d) Intoxications—tobacco, uremia, diabetes, hyperadrenalinemia, pregnancy, menstruation.

**PATHOLOGIC ANATOMY.**—Usually the pyloric sphincter is not markedly hypertrophied. The stomach may be dilated, if the spasm is long-continued.

#### TYPES:

(1) *Intermittent*.—This type is common.

(2) *Continuous*.—This type is rare.

#### SYMPTOMS:

(1) *Intermittent Type*.—

(a) The appetite is fair, but the desire for food disappears almost immediately after the patient begins to eat.

(b) A few minutes after eating, there appears a sensation of fullness and epigastric oppression.

(c) Soon thereafter a sensation of compression and stifling presents itself. This comes in connection with a sympathetic vasomotor syndrome, congestion of the face, coldness of the extremities, a tendency to sleep, dyspnea, palpitation, fatigue, etc.

(d) Pain is inconstant; it is present usually when there is an associated ulcer.

(e) Belching and pyrosis are common.

(f) Nausea and vomiting are unusual.

(g) After several minutes the pyloric sphincter relaxes, and the gurgling of food passing into the duodenum is heard. The relief is immediate.

(h) *Signs*:

(1) Rigidity of the right upper quadrant.

(2) Rarely can one feel the spastic sphincter.

(3) If the rigidity is overcome, it is occasionally possible to feel the stomach in a contracted state.

(4) If the spasm is frequently repeated, clapotage may be

elicited long after the stomach should have emptied itself—three hours after eating.

(2) *Continuous Type*.—The symptoms resemble those previously described except that they are continuous. After a long time, they are like the symptoms of pyloric stenosis—dilatation of the stomach, visible peristalsis and vomiting.

LABORATORY FINDINGS.—These are of minor importance.

(1) *Ewald Meal*.—The amount obtained one hour after ingestion of this meal is usually increased by 150 c.c. or more. The chemical findings vary. Hyperchlorhydria is frequently found.

(2) *Fasting Contents*.—In the intermittent type, usually nothing is obtained. In the continuous type, some fluid, with marked acidity, is obtained.

(3) *Röntgenologic Studies*.—As soon as the bismuth reaches the stomach, part of it passes through the pylorus before the sphincter contracts. The pylorus then appears as a clear, transverse band, one to two fingerbreadths in height. This appearance is characteristic. Above the pyloric band can be seen the bismuth in the duodenum in an immobile column. Below the band is the gastric shadow—also immobile at first, later agitated by violent peristaltic waves. This appearance lasts for about fifteen minutes. After relaxation of the sphincter, the bismuth can be seen rapidly entering the duodenum, not in small amounts, but *en masse*.

(4) *Pharmacologic Studies*.—Belladonna or atropin relieve the spasm, but have no effect on stenosis. Adrenalin and suprarenal gland bring out a latent spasm and exaggerate one which is present.

PROGNOSIS.—This depends entirely upon the etiology.

DIAGNOSIS.—This is easy in most cases, and fluoroscopic examination gives a characteristic picture.

TREATMENT.—(1) Remove the etiological factor, if possible.

(2) Regulate the diet—avoid excitomotors, spices, sauces, fats, alcohol, coffee. The food should consist of vegetables, milk and eggs, and should be well masticated. Hot drinks are usually preferable to cold ones.

(3) After meals, there should be a rest-period without smoking.

(4) Belladonna may be given if desired. It is much better in this condition than opium.

(5) Bromids, if there is no associated gastritis, often give good results.

(6) Drugs to coat the stomach are often useful: bismuth and gelose-gelatin.

(7) Hot compresses applied over the epigastrium often afford relief.

S. KAHN.

LABBE, M., AND CARRIE, P. A.: The Enterohepatic Theory of Urobilinuria. *La Presse médicale*, June 2, 1920, xxviii, No. 36, pp. 353-4.

According to the enterohepatic theory, urobilinuria results from the following mechanism: The biliary pigments enter the intestine together with the bile, where they are transformed by a process of hydration into stercobilin, a body identical with urinary urobilin. Stercobilin, or fecal urobilin, is partially excreted with the feces, and partially reabsorbed and carried to the liver through the portal vein. If the liver be normal, it utilizes the urobilin for the formation of bilirubin. When the liver cells cannot retain the urobilinuria, due to disease, a urobilinemia results, of which the urobilinuria is a manifestation. Urobilin is therefore intestinal in origin. Urobilinuria is of hepatic origin.

S. KAHN.

TURNBULL, J. S.: Disturbances Caused by Proteins. *The Boston Medical and Surgical Journal*, May 13, 1920, clxxxii, No. 20, p. 493.

Disturbances in the body caused by proteins are known by various names, such as hypersensitiveness, protein sensitization, anaphylaxis or allergy. Sensitizations are either hereditary or acquired. The hereditary form may be transmitted from mother to offspring, passing through successive generations; or it may be absent in a few generations and reappear later. Thus there may be different individuals of the same family of different generations subject to disturbances of the respiratory tract. One may have a vasomotor rhinitis, another, seasonal hay-fever, and a third, asthma, or all may have seasonal hay-fever occurring either at the same or different seasons.

Acquired sensitizations are produced as follows:

(1) Some intercurrent disease; infectious, prolonged illness; over-exertion; worry.

(2) Absorption of bacterial products from some focus or foci.

(3) Over-eating or repeated eating of certain articles over a long period of time; or they may be due to eating certain foods too soon after an illness. There may be a combination of one or more of these sources in the same individual.

The avenues of entrance of proteins are respiratory, gastro-intestinal, focus or foci of infection, cutaneous. Or these avenues may be combined. The disturbance may express itself in headaches, vasomotor rhinitis, hay-fever, chronic bronchitis, bronchial asthma, hyperacidity, nausea, vomiting, flatulence, constipation, diarrhea, gastro-intestinal colic, arthritic manifestations, or cutaneous disturbances such as eczema, urticaria, prurigo, erythema multiforme, angioneurotic edema.

Hay-fever is produced by the pollen proteins. For instance, the pussywillow in March, the birch in April, the flowering fruit trees in May, grasses and roses in June and July, ragweed and golden rod and many others in August and September.

The duration of effects varies from two to ten weeks. Those having the August and September varieties are the greatest sufferers. The treatment may be (1) to send the patients to pollen-free places such as on an ocean voyage; and (2) to desensitize them to the pollen to which they are sensitive. Desensitizing treatment begins with small doses at intervals of from three to seven days and is regulated according to the symptoms.

The author believes that in asthma a vasomotor dilatation occurs with a watery exudate and mucus secretion, which causes considerable edema of the lower respiratory tract, a diminished diameter of the bronchial tube and consequent pressure on the nerves of the edematous area, which area, no doubt, acts by producing a spasmodic contraction of the bronchial muscles. The author believes also that by putting proteins to which the patient is sensitive into the gastro-intestinal tract, there is experienced the same vasomotor disturbances of different parts of the whole tract; viz., vasodilatation. With this edema of the gastro-intestinal mucosa and submucosa, there arises hyperacidity and in some cases hypoacidity. These changes,



taking place in the stomach or duodenum, may simulate gastric or duodenal ulcer, and, in the intestinal tract, an acute obstruction or appendicitis. Six cases are reviewed.

M. M. BANOWITCH.

SERGEANT, E., PRUVOST., AND BORDET, F.: Meningococcus Sepsis Without Meningeal Reaction Cured by Intravenous Vaccinotherapy. *Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, Apr. 1, 1920, xxxvi, No. 12, pp. 428-436.

The authors treated a patient who presented an intermittent fever, arthritic pains, and a papular rash, and in whom blood culture showed a meningococcus. Examination of the cerebrospinal fluid gave negative results.

The usual methods of treatment were of no avail. Intravenous injection of meningococcus stock vaccine produced immediate favorable results.

The therapeutic success obtained by intravenous stock vaccine therapy as compared with the uselessness of intravenous serotherapy and of subcutaneous vaccinotherapy, proves that it is the method of choice in treating meningococcemias which are of long duration. It is questionable as to whether the vaccine thus employed acts specifically or in the way in which colloidal substances act, in producing the crisis. The authors are of the opinion that the vaccine has a specific action, in view of the fact that serotherapy had no very prolonged effect upon the course of the temperature, and because intravenous injections of colloidal substances produced no results.

S. KAHN.

FRAIKIN, A.: The Sign of the Solar Plexus in the Abdominal Imbalance (Le signe du plexus solaire chez les déséquilibrés du ventre). *Paris médical*, Paris, Feb. 14, 1920, No. 7, p. 143.

The author characterizes as abdominal imbalance all cases presenting indefinite abdominal symptoms. He does not claim any credit for the discovery of the sign he discusses, but he was able to

find it in every case with abdominal disease. The sign consists in a sensation of pain evoked by pressing upon the abdomen with one or two fingers. This pain has generally been wrongly interpreted. It does not depend upon pyloric trouble or an inflammation of the transverse colon, as most of the authors seem to infer; but it is due only to an hypersensibility of the solar plexus. To detect the sign it is a good practice to search for it both with the patient lying down and in an upright position. In many cases the decubitus will prove a very bad position in which to make an effectual examination. It is best to make the patient stand with his back to the doctor while the latter embraces the abdomen and exerts pressure.

The pathogenesis of the solar plexus pain consists according to the author, in an alteration of the abdominal circulation, intoxication, but especially in ptosis accompanied by elongation of the ligaments supporting the abdominal viscera. This gives rise to elongation of the nervous fibers. The abdominal imbalance is encountered most frequently among women.

The sign indicates the presence of an abdominal neuropathy. The regulating centers of the abdomen are altered. It indicates that no matter what the somatic abdominal trouble is, the abdominal nervous system of the patient is in poor condition. The presence of the sign will enable one to make a more definite differential diagnosis, and to administer more effective treatment.

C. F. ARROYO.

LEGREY, COURCOUX AND LERMOYEZ, J.: Study of Benign Typhus Fever. *Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, May 6, 1920, xxxvi, No. 15, pp. 524-31.

The authors studied 8 cases of typhus fever, in which the diagnosis was confirmed by the laboratory findings. The symptomatology in all the cases was classical—with the following three exceptions:

(1) *The Character of the Eruption.*—The typical rash of typhus is usually described as becoming petechial rapidly. In none of the cases presented was the eruption petechial in character. To hesitate to make a diagnosis of typhus merely because the eruption is not petechial is a grave error.

(2) *The Meningeal Reaction*.—Classical authors fail to insist upon the importance of the meningeal reaction in typhus. The authors found an increased cell count in the cerebrospinal fluid in all of their cases, and they believe that this reaction is among the important findings in that disease.

(3) *Hypertrophy of the Spleen*.—Though usually described as a constant symptom, the authors found no splenomegaly in three of their cases, and in the remaining five, the hypertrophy was not at all marked.

S. KAHN.

HUTINEL, V., AND STEVENIN, H.: Hereditary Syphilis and the Dystrophies. *Archives de médecine des enfants*, Paris, April, 1920, xxiii, No. 4, p. 205.

Hereditary syphilis may produce effects which may vary from the death of the fetus to changes of no demonstrable character. In athrepsia the Wasserman reaction was found by several French authors to be positive in from 33 per cent to 66 per cent of cases. Hereditary lues predisposes to athrepsia and to hypotrophy, a milder degree of athrepsia, especially in artificially fed children. While the authors admit that syphilis may not be the sole cause of rickets, it must always be considered and sought. In doubtful cases of rickets in young infants the stigmata of lues and a positive Wassermann will confirm the diagnosis of rickets. In late and prolonged rickets, *status lymphaticus*, increase in lymphatic tissue, anemia, infantilism, dwarfism, gigantism, obesity, emaciation and chronic rheumatism, syphilis may be the basic factor through its action on the endocrine glands and bone. Hereditary lues may also produce dystrophies, especially endocrine disturbances, in the parent which may be transmitted to the offspring without the child having syphilis. The authors quote several cases in which the mother had hereditary syphilis with a positive Wassermann reaction and endocrine dystrophies such as exophthalmic goiter and the children presented symptoms of hypothyroidism and had negative Wassermans. The children improved under treatment with powdered thyroid and hypophysis. The authors emphasize again that, although all forms of dystrophy can be caused by hereditary syphilis, none are specific to it.

They are often the result of luetic lesions in organs and glands or functional disturbances, and are not due directly to syphilis itself. The therapeutic indications in all dystrophies in which lues is suspected, or in which the Wassermann reaction is positive, are the administration of neosalvarsan and mercury until all suspicions of syphilis disappear. If the endocrines are involved, extracts of the particular gland or glands affected should be given. The hygiene should also be improved.

W. C. DAVISON.

Goubeau, M.: Hereditary and Acquired Syphilis—Hypersyphilis. Proceedings of the *Société française de Dermatologie et Syphélographie*, Mar. 11, 1920; reported in *La Presse médicale*, Mar. 31, 1920, xxviii, No. 18, p. 178.

Goubeau has seen many patients with hereditary syphilis, who also had acquired syphilis.

This acquired syphilis has several peculiar characteristics:

- (1) Incubation period of the chancre is long.
- (2) The chancre is often phagedenic.
- (3) The secondary eruption is often intense, very varied and severe.
- (4) This syphilis is often associated with local and general disturbances—recurring herpes, fever, asthenia, etc. The nervous symptoms are marked—headache, neuritis, paralyses, meningitis, encephalitis, myelitis.

This *hypersyphilis* demands intensive and persevering treatment.

S. KAHN.

Poulard, A.: Treatment of Syphilis by Subcutaneous Injections of Novarsenobenzol. *La Presse médicale*, June 9, 1920, xxviii, No. 38, pp. 376-7.

For five years Poulard has administered novarsenobenzol subcutaneously instead of intravenously, and with marked success. The objects necessary for the injections are:



- (1) A 2 c.c. glass syringe.
- (2) A short needle—3 cm.
- (3) An ampule containing 15 cm. of novarsenobenzol.
- (4) An ampule containing 1 c. c. of a 1/100 novocain solution.

*Technic.*—(1) The solution of novocaine is poured into the ampule containing the arsenobenzol. The latter readily dissolves.

(2) This solution is drawn into the syringe and injected into the buttock. The shortness of the needle precludes the possibility of the injection being given intramuscularly.

(3) Injections are given daily, or every other day, depending upon the intensity with which it is desirable to treat the individual patient.

The author has never had any local or general reactions from this method of treatment.

S. KAHN.

STERLING, A.: The Sugar Treatment of Tuberculosis. *Medical Record*, Dec. 6, 1919, xvi, 927.

Sterling's object in presenting this paper is to stimulate the general practitioner's interest along the line of saccharose therapy in tuberculosis. His own interest in this subject was aroused by the work of Underhill and Closson (*Journal of Biological Chemistry*, 1906, ii, 127), Goulston (*British Medical Journal*, March 18, 1911, 615), Sawyer (*Ibid*, April, 1911) and Lo Monaco. The latter (Lo Monaco) found that the administration of sugar reduced suppuration and hastened the healing of wounds. He also found that in nursing women the secretion of milk was augmented by small injections of saccharose, and decreased by larger doses, but when the women were tuberculous, night sweats and expectoration also decreased and they gained weight. Raimondi (Abstract in the *Journal of the American Medical Association*, May 13, 1919, 1337) obtained similar results.

The author's experience in 6 cases of tuberculosis bears out, in his opinion, the contention of Lo Monaco, and he advises as a routine measure, injections of saccharose in 5-grain (0.324 gram) doses, dissolved in 5 c. c. of sterile distilled water. The above injections

should be given daily or every other day in the gluteal region. They are absolutely harmless.

From his experience, Sterling is led to these conclusions:

- (1) In tuberculous patients subcutaneous saccharose injections had very little, if any, effect upon the fever.
- (2) Night sweats and expectoration ceased almost immediately.
- (3) The reduction of the cough was not in proportion to the diminution of the expectoration; hence a dry, distressing cough, present in the beginning, was generally controlled later on.
- (4) There was a marked gain in weight and strength with an amelioration of the toxæmia and its accompanying depression.

M. KESCHNER.

WALKER, O. J.: Pathology of Influenza-Pneumonia. *The Journal of Laboratory and Clinical Medicine*, Dec., 1919, v, No. 3, p. 154.

The pneumococcus and hemolytic streptococcus were the most frequent secondary invaders found in the lungs at autopsy in the pneumonias at Camp Sherman. Pfeiffer's bacillus was found in only 4 per cent of the cases.

Interstitial and lobular bronchopneumonia cannot be regarded as a typical lesion resulting from the invasion of the *Streptococcus hemolyticus*. In these types of pneumonias the pneumococcus was found to be the only invader just as frequently as was the hemolytic streptococcus. In fact, it is doubtful whether the type of organism isolated from pulmonary tissue in pneumonia is of any great value in determining the type of pneumonia present, for the type of organism concerned and the type of lesion in the lung are decidedly variable at different times, even at the same location.

Influenza-pneumonia is primarily an acute, hemorrhagic lesion, interstitial, nodular, or massive in extent, arising from a pulmonary, capillary, phlebitis with disseminated capillary necrosis due to some toxic agent, and resulting in secondary purulent pneumonia with healing by organization.

The organism or organisms predominating in the nose or throat in the individuals in any particular section of the country is the organism most commonly found in cultures and tissue sections from the lungs of secondary pneumonias in that section.

Emphyema and pericarditis are frequent complications.

The specific etiologic agent of influenza has not been determined to the satisfaction of everyone. The incidence of pneumonia from influenza was 30.13 per cent of all influenza cases. The mortality from the pneumonias was 39.59 per cent, and from all the influenza cases 11.63 per cent.

C. M. ANDERSON.

BENNEK: The Treatment of Grippe with Bichlorid Injections (Zur Behandlung der Grippe mit Sublimatinjektion). *Münchener medizinische Wochenschrift*, April 30, 1920, No. 18, 515.

It was observed that syphilitic patients under treatment were seldom subjects of influenza. From this observation it was attempted to use prophylaxis in sixty healthy individuals by using unguentum hydrargyri ciner. in the nasal passages. Not one acquired the disease. Of 250 cases of influenza treated with 1 c. c. of 1/1000 bichlorid injection not one succumbed. Even those patients with pneumonia recovered. Children were also benefited by the same treatment. The author highly recommends the sublimate treatment.

H. JOACHIM.

RIESMAN, D.: Pleural Effusion with Inversion of the Diaphragm Producing an Abdominal Tumor; together with Remarks on Acute Pulmonary Edema Following Tapping. *The American Journal of the Medical Sciences*, March, 1920, clix, Part 3, No. 576, p. 353.

A patient aged seventy-seven, suffering with diabetes mellitus and chronic nephritis with moderate hypertension, suddenly was seized with an attack of acute indigestion. In a few days marked breathlessness, cyanosis, accompanied by fluttering of the heart set in. Examination revealed the fact that the heart was displaced

to the right. The left chest showed signs of fluid. Abdominal examination disclosed a large, tense, rounded mass, slightly uneven, not the shape of the spleen or kidney, slightly tender, not movable with respiration, appearing to be attached deeply, occupying nearly the entire left half of the abdominal cavity, down to the umbilicus. The pleural fluid was confirmed by thoracentesis. Five points were obtained slowly, and this relieved the tumor mass. Pulmonary edema developed in about a half hour. Morphin and atropin had no effect. Dry cupping relieved the edema almost immediately. The author believes that this is a good therapeutic measure in all forms of acute pulmonary edema, whether it be due to tapping or to other causes.

A. T. MAYS.

AUDRAIN: Treatment of Pertussis by Intramuscular Injections of Ether. Proceedings *Société médicale des hôpitaux de Paris*, June 4, 1920; reviewed in *La Presse médicale*, June 4, 1920, xxviii, No. 38, p. 377.

Audrain has treated several cases of whooping cough by intramuscular injections of 2 c.c. of ether, given every other day. In those cases which were accompanied by simple nasopharyngeal congestion only, excellent results were obtained after three or four days of treatment. In complicated pertussis, the results were not as satisfactory.

The author believes that the ether is valuable not because of its antispasmodic action, but because of its anti-infectious properties.

S. KAHN.

MCCRAE, T.: The Physical Signs of Foreign Bodies in the Bronchi. *The American Journal of Medical Sciences*, March, 1920, cliv, Part 3, No. 576, p. 313.

In the Jefferson Hospital these cases are comparatively common and are of much clinical interest. The roentgen-rays aid greatly in the discovery of certain foreign bodies, but there are substances which



are not recognized by roentgen-ray; this is true in probably from 10 to 15 per cent of all cases. In cases of this type the study of physical signs is very important. There may be no disturbance at the time of the entrance of a foreign body, and, furthermore, there may be no suggestion of such a happening in the history which the case presents.

Two groups of unrecognized cases are defined. The first is that in which the body sets up such an acute inflammatory process that the diagnosis of pneumonia has usually been made. This is likely to occur in a child after the aspiration of some sort of nut, e. g., a peanut. In the second group the symptoms are more chronic. As a result a diagnosis of pulmonary tuberculosis or bronchiectasis has usually been made. The clinical signs vary markedly. A closed safety pin is not apt to cause as much damage as a screw or tack which plugs a bronchus. The foreign body is more often on the right side and has a tendency to go to the bronchi supplying the lower lobes. It is not uncommon to find signs over both lungs, influenced by the cough and the amount of secretion. The most valuable sign is decreased expansion on the effected side. Very fine râles often occur; the author feels that these are different from those heard in any other conditions, and in his experience they have been heard only when the body was metallic. Confusion occurs with pneumonia in cases with fever, dyspnea, cough, blood-streaked sputum, and pain until a careful examination is undertaken. If the condition is pneumonia, there is a plugging of the bronchus—a rare condition. The author has not seen pneumonia associated with any case of foreign body in a bronchus. Fibrosis and abscess formation are wrongly diagnosed as tuberculosis after the foreign body has been present for some time. An “asthmatoïd wheeze” (Jackson) may be heard, if the bell of the stethoscope is placed close to the patient’s mouth. It is not heard over the chest wall. Certain bodies set up very acute and dangerous changes, among which the peanut takes first place. A very rapid and severe reaction follows. When consulted for a child who suddenly develops fever, restlessness, dyspnea with cyanosis, paroxysmal cough, presenting the signs of diffuse generalized bronchitis attended with wheezing respiration, the possibility of peanut bronchitis must be thought of. The younger the patient the more serious is the prognosis.

A. T. Mays.

LEVY, C. S.: Congenital Absence of One Lung. *The American Journal of the Medical Sciences*, Feb., 1920, clix, Part 2, No. 575, p. 237.

This is the twenty-second case reported in literature, and the first case in almost 6000 autopsies performed at Johns Hopkins Hospital. The patient had tabes and bilateral pyelonephritis. He died at the age of fifty from bronchopneumonia and uremia. The thorax was asymmetrical, the right half being more prominent. At autopsy the right lung was found to be of tremendous size, completely filling the right pleural cavity, extending into the anterior part of the left hemithorax, so that the uppermost anterior margin came to lie at the left apical region to which it adhered. The anterior thorax was occupied by a large part of the upper lobe and by the whole middle lobe. The right pleural space was empty. The left lung was absent. In its place the heart was displaced by the size of the right lung. No trace of left pleura was found. The trachea was large in diameter. The left primary bronchus was represented by a small blind pouch at the point of bifurcation. There were no left pulmonary artery or veins. The left innominate vein emptied directly into the right auricle. The left phrenic nerve coursed close to the chest wall.

In these 22 cases on record the left lung was found to be absent fifteen times and the right lung seven times. Twelve patients observed died before they were one year old, others lived from eight to seventy years. Respiratory symptoms have not been common; the patients have often come to autopsy for other than pulmonary conditions. In cases reported previously to this one the chest has been normal in contour. The thorax in this case was definitely asymmetrical, the left side being flat, the opposite side, bulging.

A. T. MAYS.

KINNE, A. L.: An Unusual Case of Myelitis. *The Boston Medical and Surgical Journal*, April 15, 1920, clxxxii, No. 16, p. 398.

A case is reported of a vigorous young man of thirty-seven who complained of slight cough and sore throat. His temperature was 99° F. (37.22° C.) and his physical examination was negative ex-

cept for a reddened pharynx. Two days later he presented a picture of a mild influenzal infection with temperature of  $100.6^{\circ}$  F. ( $38.11^{\circ}$  C.), headache, cough, and malaise. Next morning he could not void, and the bladder reached half way to the umbilicus. He next stated that he could not move his feet, and examination confirmed this fact. There was loss of sensation below a line across the abdomen just below the level of the umbilicus. The knee-jerks were diminished very much; no Babinski or ankle clonus were present. Five days later he showed a spastic paralysis of the lower extremities with knee-jerks very much exaggerated. There were present: marked Babinski on both sides, slight ankle clonus, abdominal reflexes, absolute motor paralysis of both legs, complete anesthesia, retention of urine, and bowel distension while there was a loss of cremasteric reflexes. The Wassermann was negative, the temperature normal, the pulse 80; the white blood cells numbered 15,800. An x-ray of the spine gave a negative picture. Spinal puncture was not done. Nine days later the patient could move his legs a little and had some feeling in them. Eighteen days after the onset of the illness he voided for the first time. Improvement was rapid, so that nine weeks after the onset he was back to work, able to walk perfectly. His reflexes were normal, except that there was a slight aggravation of the knee-jerks. The treatment was purely symptomatic.

M. M. BANOWITCH.

BRAM, I.: The Circulatory System in Exophthalmic Goiter. *International Clinics*, 1919, i, 29th series, p. 80.

Bloch reiterates the well-known fact that Graves' disease never exists without some manifestation of circulatory disturbance. It is the circulation which is most affected by hyperthyroidism, and it is the heart which in the last analysis determines the course and prognosis of the disease; its collapse is usually the direct cause of death in exophthalmic goiter.

He discusses the subjects under the following headings:

I. HEART.—A. *Subjective Symptoms*.—(a) *Palpitation* occurs at the onset of the disease, but only to a slight degree, and only



on physical or mental exertion. Later it troubles the patient by producing restlessness, nervousness and sleeplessness. As the disease advances it becomes continuous, with exacerbations during exercise and emotion. The palpitation is most marked when the individual is lying on the left side. In fact, he cannot sleep except when lying on his right side or on his back. Whether the accompanying nervousness occurs independently of the palpitation, or whether the palpitation precedes and produces the nervousness is, according to the author, a question still to be solved. The severity of the palpitation bears no relation to the degree of tachycardia; a patient with a mild tachycardia may have a severe palpitation and *vice versa*.

(b) *Anginoid precordial pains* may be so severe as to simulate angina pectoris and occasion a degree of unconsciousness of variable duration, particularly when the subjective cardiac symptoms are very marked. True angina pectoris in a patient with a thyrotoxic heart is quite rare, and when it does occur it is chiefly in males who give a history of lues, alcoholism or chronic nicotin-poisoning.

(c) *Dyspnea* of varying degree is quite common. When marked and accompanied by diminished chest expansion plus the characteristic loss of strength and weight, it may lead to a wrong diagnosis of pulmonary tuberculosis.

B. *Objective Symptoms*.—(a) Tachycardia depends upon the duration and severity of the disease and the condition of the heart before the onset. It may vary from 90 to 200 beats per minute. Its mechanism is best explained on the theory of stimulation (by thyroid intoxication) of the accelerator cardiac nerves derived from the sympathetic, and, to a lesser degree, of the inhibitory fibers of the vagus. The acceleratory stimulation, being far in excess of that of the inhibitory, gives rise to the enormously rapid heart-rate. A distinctive characteristic of this symptom is its constancy, which may even persist during sleep. The author states that this tachycardia of Graves' disease must be differentiated from the rapid heart action which one meets clinically in emotional states, hysteria, neurasthenia, febrile affections, the various toxemias, the essential anemias, the so-called paroxysmal tachycardias, chronic and acute endocarditis, surgical shock, hemorrhage, diseases of the central tuberculous foci, Addison's disease, and arthritis deformans. The rapid heart which was so frequently met with in the war neu-



roses cannot, according to Bloch, be easily differentiated from hyperthyroidism; as a matter of fact, he believes most of the so-called "shell shock cases" are cases of real Graves' disease, and that in a few of them the tachycardia was due to chronic nicotin-poisoning, due to overindulgence in the tobacco which was so liberally distributed to the soldiers during the war by "well-meaning" patriotic ladies' societies.

(b) *Physical examination* with attention to the condition of the myocardium is of value, because it gives information concerning the course and the prognosis of the disease. *Inspection* in mild cases shows an intense and diffuse heart-beat, the apical area being greatly increased in size. As the condition advances the entire chest seems to shake from the intensity of the heart beats; this may also be observed when the patient is perfectly quiet. More advanced cases present a diffusion of the apex beat which may extend even into the left axillary space. *Palotio*n, in moderately advanced cases, reveals a thrill over the cardiac areas, especially in late cases in the presence of mitral regurgitation, in which instance the palpative hand will be raised with each systole. *Percussion* presents in early cases nothing unusual, but when the heart becomes hypertrophied and dilated, its area may be made out to extend down and to the left until the apex reaches the sixth or seventh interspace at or near the axillary line. Careful percussion of the upper part of the sternum may reveal the presence of an enlarged thymus. These findings can be best confirmed by *x-ray* examinations. Thyrotoxicosis of the myocardium, resulting in cellular degeneration, and cardiac exhaustion through increased activity, are eventually the causes of the dilatation of the heart. *Auscultation* at the onset of the disease may reveal a forcible and accelerated apex beat and possibly a hemic murmur at the base; later, when dilatation has set in, the heart-beat is heard to be feeble, and finally a mitral systolic murmur at the apex, transmitted into the left axillary space, is audible. With further dilatation, an aortic and tricuspid murmur are apt to develop, leading finally to anasarca and cardiac failure. Dangerous dilatation with an impending decompensation is frequently ushered in by cardiac arrhythmia. The "gallop rhythm" (Sahli) is a triple rhythm heard over the entire heart; the sounds follow at almost equal intervals. The second of the three sounds is ordinarily found to be accentuated over the apex and the third over

the great vessels. The extra sound occurs during diastole just before the normal first sound, and differs from the presystolic element of mitral stenosis in that it is generally heard over the entire precordial area. These phenomena are probably due to excessive cardiac stimulation, producing either an abnormally quick diastolic relaxation followed by a sudden passive tension of the left ventricular wall from the entering column of blood or an increased contraction of the auricle.

II. BLOOD-VESSELS.—A. *Subjective Symptoms*.—(1) A throbbing sensation is felt in the thyroid gland itself, on account of increased vascularity in the organ.

(2) If the thyroid is very large, the patients experience pressure symptoms in the trachea, esophagus, and sometimes in the carotid sheath. This results in dyspnea, difficulty in swallowing, altered voice, dizziness, headaches and even syncope. Congestion of the nasal mucous membrane may give rise to epistaxis.

(3) Throbbing sensations are noted in the other large vessels of the body (carotids, subclavian, radial, ulnar, femoral), not unlike that which occurs in aortic regurgitation.

B. *Objective Symptoms* (1).—*Inspection* usually reveals a large thyroid with greatly increased superficial veins beneath the skin. The gland itself and the large vessels of the body may also be seen to throb with each cardiac cycle. Palpation of the thyroid usually presents a systolic thrill. The pulsation in the gland may be felt by the examining hand, and may seem to the observer almost as expansile in character as those of aneurysm. Moderate pressure may elicit tenderness in the gland. Compression of the gland, especially when it is very vascular, may result in a temporary partial diminution in its size because of the expression from it of a quantity of blood. A venous pulse, diastolic in time, may occasionally be felt in the jugular veins.

(2) *Auscultation* over the thyroid usually reveals a harsh systolic and occasionally also a diastolic murmur. This is an important diagnostic point in the differentiation of a simple nontoxic goiter from one of a hyperacting thyroid gland. The carotids and subclavians also give rise to a systolic and occasionally to a diastolic hum.

The objective symptoms of the vessels elsewhere include (a) throbbing of the superficial arteries; (b) capillary pulse elicited by

the fingertips or by pressure of a glass slide upon the mucous membrane of the lips; (*c*) a small, rapid pulse of poor volume, depending upon the stage of the disease and degree of repose of the patient. (The pulse may be dicrotic and in advanced cases arrhythmic); (*d*) dermatographia and symptoms of vasomotor instability, such as large patches of erythema over the skin; (*e*) the blood-pressure is, on account of myocardial overactivity, somewhat higher at first, but later, as the circulation relaxes, it may drop to from 130 to 120 mm. and with further cardiac weakness it may come down to from 100 to 90 mm., associated with considerable cyanosis and dyspnea.

III. BLOOD.—Subjectively, the symptoms are those which accompany a secondary anemia from any cause. Although much of the weakness of which the patient complains may be partially due to the anemia, the latter, according to Bloch, does not form an essential feature of the disease. The objective points with regard to the blood are not constant. Leukopenia may be said to be more or less constant. The leukocytes may drop to six or even five thousand per cu. mm. A relative lymphocytosis accompanies the leukopenia; the increase may be up to 50 per cent, with a predominance of the small lymphocytes. The polymorphoneutrophils are diminished. These changes, according to Koch, are due to the presence of an increased amount of thyroid secretion in the circulation, resulting in a stimulation of the lymphatic system; intravenous injections with thyroid extract give rise to a similar blood-picture. Bloch assumes that the lymphocytosis is another phase of the vicious circle in the evolution of this disease, and that it may possibly be due to a hyperactivity of the enlarged thymus. The large thymus may be caused by thyroid hyper-activity, the excess of thyroid substance in turn stimulating the growth of the thymus.

\*The author cites Crotti, who claims that the more intense the white blood-corpuscle picture, the worse the prognosis; a high lymphocyte percentage with a moderate leukopenia is a good prognostic sign; the reverse is claimed in the presence of a marked leukopenia and a low lymphocyte percentage. The persistence of an abnormal blood-formula is said to prove a remaining degree of thyrotoxicosis, or possibly a gradual change of hyperthyroidism into hypothyroidism.

Early cases show no change in the erythrocytes; in fairly advanced cases they may be reduced to four million or less, with a great-



er diminution in the hemoglobin content. Occasionally, owing to increased metabolism and vasomotor instability the patients may give a false impression of an existing plethora. Local vasomotor paralysis may, in isolated instances, give rise to dangerous hemorrhages from the nose, lungs, stomach, or intestines. The difficulty of controlling excessive bleeding in many cases of thyroidectomy may be explained by the diminished coagulability of the blood, which is quite a constant feature, and which is of value as a prognostic sign from an operative point of view. Hyperglycemia is also an important feature of the disease. The ingestion of 100 grams ( $3\frac{1}{4}$  ounces) of sugar, in the case of a normal individual, causes no increase in the sugar content of the blood, which is normally about .085 per cent. The ingestion of the same amount of sugar, in the case of a patient with Graves' disease or one fed on large quantities of thyroid extract, increases the sugar content of the blood to about double its former amount. This hyperglycemia cannot be said to be of primary, but rather secondary, or alimentary origin.

Adrenalinemia, complement-fixation, and antitrypsin of the blood, the viscosity, and other similar laboratory refinements in the study of the blood in patients with Graves' disease are, according to Bloch, of little or no practical value, and are therefore not discussed in this paper.

M. KESCHNER.

Foss, H. L.: The Treatment of Goiter. *New York Medical Journal*, Feb. 14, 1920, cxi, 285.

The most important element in the treatment of goiter, according to Foss, is the correct diagnosis. Failure of success in an individual case may always be traced to failure of selection of the proper therapeutic procedure for that case. A patient with exophthalmic goiter must be studied with the greatest thoroughness. Studies of the basal metabolism in these cases are of primary importance; blood-sugar determinations and the various forms of the Goetsch test, skin reaction after adrenalin injection, while they are perhaps of less importance, are nevertheless of great diagnostic aid.

Some cases are decidedly aggravated by surgical treatment, others, in which surgical treatment is indicated, are not influenced by other



than surgical methods and are allowed to go unoperated until they cannot be considered good surgical risks.

For the colloid goiters of adolescents, iodine and its preparations are unquestionably of value; these goiters are not surgical and call for medical treatment, but it is a waste of time to use non-surgical methods in the adenomatous type, whether or not toxic, inasmuch as all of them are potentially toxic.

"No type of surgery", says Foss, "is more highly specialized than that of goiter." The proper management of the pre-operative and postoperative stage is more important than the actual operation. In well-selected cases, surgery offers more definite, more immediate, and more lasting results than any other form of treatment.

Many goiter operations are best performed with the patient in bed under nitrous oxid anesthesia, the thyroidectomy being frequently preceded by ligation of the superior or inferior thyroid vessels. In all cases Crile's methods are to be followed; the mental side of the patient must be considered; the elements of anxiety and fear must be reduced to a minimum; in some cases it may be wiser to perform the operation in one, two or even three or four stages, or to use combined general and local anesthesia. Each individual case has its own special indications.

At the Greisinger Memorial Hospital the author performs preliminary ligations on over 50 per cent of his exophthalmic patients. Hot water injections have been discarded. Their real value lies in the fact that they indicate fairly well the patient's ability to undergo a more radical operation, but this fact can as a rule be determined just as well by a thoughtful preliminary study of each individual case.

M. KESCHNER.

MARINE, D., AND KIMBALL, O. P.: Prevention of Simple Goiter in Man. Fourth Paper. *Archives of Internal Medicine*, June, 1920, xxv, No. 6, p. 661.

The experimental plan for the prevention of simple goiter in the children of the public schools of Akron, Ohio, has been described from time to time by the investigators as the work progressed. In the present paper a summary of the work covering thirty months is

presented. During this period about ten thousand (10,000) children have been observed. A group of about two thousand children to whom prophylactic treatment was administered in the form of 2 grams of sodium iodid, given in 0.2 gram doses daily, for ten consecutive school days, repeated each spring and autumn, was observed long enough to note the results, and compared with a similar group of about the same size receiving no treatment. In the first group, five developed thyroid enlargement in spite of the treatment. In the second group 495 developed thyroid enlargement in the absence of treatment. From the therapeutic point of view, it was noted that of 1,182 pupils with thyroid enlargement at the first examination and who took the treatment, 773 thyroids decreased in size, while of 1,048 pupils with thyroid enlargements at the first examination and who did not take the treatment, 145 thyroids decreased in size.

T. HOWARD.

FRAZIER, C. H.: The Principles Underlying the Treatment of Toxic Goiter. *Pennsylvania Medical Journal*, 1920, xxiii, 437.

Every patient with signs of incipient thyrotoxicosis should have an intensive examination with a view to eliminating possible predisposing factors, for the discovery and proper treatment of pyorrhea, of infected tonsils, or of stasis may avert subsequent disease. He should be given mental and physical therapy, including prevention of fatigue, as well as a neutral environment. In the mildly toxic type of the adolescent group, supervision as to hours of work and sleep and restriction of studies may be all that would be necessary. In the mildly toxic type of the adenoma group, operation is one of choice and not of necessity. The grave toxicosis of the adenomata require an eventual resection. In the initial hyperplastic goiter there is a preponderant advantage in surgical attack. In the degenerative, atrophic or the terminal stage of a hyperplasia, there is no justification for the removal of the gland tissue.

The operating room should be brought to the patient instead of the patient to the operating room. Nitrous oxid is the anesthetic of choice. If ligation is the operation, it should be a ligation of the superior pole and not alone of the superior thyroid artery.

Ligation is only of temporary value. If but one lobe is involved, the total removal of the lobe and the isthmus, plus, in some cases, ligation of the superior pole of the remaining lobe, is the operation of choice; if both lobes be involved, there should be a partial resection of both lobes, and a strip of tissue in the posterior aspect of either lobe should be left behind.

M. H. KAHN.

LISSER, H.: Coöperation by Internist and Surgeon in the Treatment of Graves' Disease. *Endocrinology*, Oct.-Dec., 1919, iii, No. 4, p. 454.

The most rapid and spectacular results are obtained by an expert thyroid surgeon, but certain medical procedures are worthy of consideration. These measures are: Absolute and prolonged rest; ice bag over thyroid, and precordium, but not continuously; high caloric diet, 2500 to 3500 calories a day; quinin hydrobromate, 0.30 grams (5 grains) and ergotin 0.065 grams (1 grain) two to four times daily;  $x$ -ray radiation of thyroid and thymus. If these measures do not suffice, surgical procedures may be instituted. Early consultation and cordial coöperation of the surgeon and internist are advised, whether the treatment be purely medical, surgical, or combined.

L. C. JOHNSON.

MOON, V. H.: Heredity as a Factor in the Etiology of Neoplasms. *Medical Record*, Jan. 3, 1920, xcvii, 14.

Moon devotes this paper to a discussion of the evidence presented to show that the hereditary tendency to neoplastic proliferation is an important predisposing cause. Most physicians, he states, can recall cases in their own experience which illustrate the tendency of tumors to occur more frequently in some families than in others. While such a familiar predisposition is recognized by many pathologists and surgeons, yet statistical proof is peculiarly difficult for many reasons. A number of investigators have collected figures on this subject, but these must be considered as representing the mini-



imum rather than the maximum of familial cancer occurrence, because of the difficulty of obtaining complete family histories with statements as to the correct cause of death, and because of failure in former years to diagnose cancer in every case.

Williams reviewed the histories of 370 female cancer patients and found a family history of cancer in 83 cases, or 22.4 per cent; 136 cases of mammary cancer showed a cancer family history in 24.3 per cent; 142 cases of uterine cancer showed a family history of cancer in 19.7 per cent. Butlin found a family history of cancer in 37 per cent of his cases, Nunn found such a history in 29.3 per cent, and Lemp, in 23 per cent. Warthin, in commenting on these figures, agrees that "in certain families the cancer chances are greatly increased, from fifteen to twenty times those of individuals of the general population. If the chances of cancer for the individuals of certain families are from fifteen to twenty times greater than for the individuals of the general population, we must concede the existence of a family tendency to cancer, since such high percentages of occurrence in certain family lines cannot be explained on the grounds of environment, infection or mere coincidence."

Levin made a study of the influences of heredity on the occurrence of cancer in a number of cancer families or so-called cancer fraternities. He found that with a cancerous ancestry the percentage of cancerous members corresponds closely with the Mendelian percentage, which is approximately 25 per cent.

Experimental studies on the influence of heredity on cancer occurrence in the human species are extremely difficult, because in man selective mating is practically impossible. This phase of the problem can be investigated by animal experimentation and, if it be admitted that the same laws of heredity are applicable to all species, the results would seem to be conclusive. Spontaneous tumors, both benign and malignant, occur in various animals with a fair degree of frequency, when the animals are allowed to reach a sufficient age.

The most extensive series of observations on this point thus far reported are those of Maud Slye of Chicago, with reference to the occurrence of tumors in mice. She found that certain strains of mice, kept pure by inbreeding, developed cancer in a high percentage, while other strains, also inbred, never developed neoplasms of any kind. At the time of her fifth report her experiments had covered a period of more than ten years, and her mouse colonies had a population of



more than 12,000 living members. She had performed more than 14,000 autopsies among which more than 2500 individual primary tumors were found. Her stock contained 3 original cancer-bearing families, from which by inbreeding she derived strains which developed cancer in 100 per cent of all members which lived to cancer age. These cancerous strains and their offspring furnished a continuous supply of from 50 to 100 living cases of cancer. Miss Slye had strains of mice which never developed tumors when tested by prolonged inbreeding, and by hybridization with other non-cancerous strains. When such noncancerous strains were crossed with cancerous strains she was able to separate from the offspring some strains which never produced cancer, and strains which regularly produced cancer, and which carried cancer occurrence into every strain with which they were crossed. She was thus able to breed cancer into a strain of mice which for many generations have been found to be free from cancer, and she was able by selective breeding to eliminate cancer from cancer-bearing families, whose percentage on one side produced cancer in 100 per cent of its family members.

This same investigator also noted that the occurrence of cancer in the offspring of hybridization between cancerous and non-cancerous strains closely paralleled the occurrence of a Mendelian recessive trait in similar hybridization. This parallelism was so close that she could predict with accuracy the percentage of occurrence of cancer in resulting strains from hybridization, and to have the predictions corroborated as successive members of the strain reached cancer age, died, and were submitted to postmortem examination.

Transmission of cancer by direct contact was also attempted, but with negative results. Mice of non-cancerous parents, caged with cancerous mice, never developed cancer. The young of non-cancerous parents were allowed to suckle from females with well developed mammary cancer, with uniformly negative results. Non-cancerous mice were fed with fresh cancer substance from other mice, but without result. Miss Slye, therefore, concludes that transmission of cancer has nothing in common with the transmission of infections. From her observations she is convinced that cancer itself is not inherited, but that the tendency of potentiality to proliferate in the lawless fashion of neoplasms is transmitted through the germ plasm to the tissues of the offspring. In her hands this has occurred in exact accordance with the laws governing the transmission of any

hereditary trait. She believes that the laws of heredity operate with the same inevitability in man as in the mouse and that the evidence of its action in humans is obscured by the difficulty of ascertaining the facts. In the human species heredity is a highly complex problem, as it represents continuous heterogeneous hybridization.

It seems, therefore, according to Moon, that conditions considered by pathologists to be possible causes of cancer probably act merely as exciting or determining factors in individuals who have received a tendency to neoplastic growth as an inheritance from their ancestors.

M. KESCHNER.

HIRSCH, E. F., AND WELLS, H. G.: Retroperitoneal Liposarcoma: Report of an Unusually Large Specimen with Chemical Analysis. *The American Journal of the Medical Sciences*, March, 1920, clix, Part 3, No. 576, p. 356.

The patient, aged 55, entered the hospital April, 1915, complaining of breathlessness, cough, swelling of the abdomen and feet. The onset of illness occurred eighteen months previously. Abdominal veins were distended with nodular masses which were palpable in the abdomen. Paracentesis yielded 5 c. c. of fluid which contained large lymphoid cells and eosinophils. The Wassermann reaction was negative. Upon lying down he did not show the dyspnea which a cardiac case with equal dyspnea would have shown. The heart and lungs were both compressed. The liver was enlarged and hard. Six months later 50 c. c. of clear pale yellow fluid was removed on paracentesis. Two years later the patient returned and in addition to his earlier complaints he had difficulty in urination and defecation. He urinated small amounts every twenty minutes. The urine contained granular casts and red blood-cells. At operation February, 1917, a large tumorous mass was found between the anterior two layers of the mesentery. It was approximately the size of five adult heads and weighed 14,340 grams (31.61 lbs.) Another large kidney-shaped mass could be seen on the right side between the posterior two layers of the mesentery; two other large masses were palpated. The tumor between the anterior layers was removed and the wound closed. The patient died in 48 hours. At

autopsy the remaining tumor mass was found to weigh 17,300 grams (38.14 lbs.). Histologically the tumor showed areas of pure fatty areolar tissue, but even in the parts that most closely resembled a benign lipoma there was occasionally found, in the interstitial tissue, a large deeply staining and abnormal nucleus. A well-defined fibrous capsule surrounded the growth. All possible transitions between the fat tissue and the solid fibromarcoma were seen. Nowhere was there any material resembling mucin in its basophilic properties. There was no mucin or so-called myxomatous tissue. The growth was a highly edematous fibro-lipo-sarcoma.

Chemically there was an absence of any considerable quantity of mucin. There were 90.53 per cent of water present showing that the tumor was largely an edematous fibrous tissue mass rather than a myxoma. Two pounds of fatty material were present and four and a half pounds of protein, despite the extremely emaciated condition of the patient.

A. T. MAYS.

LOEB, L.: Causes and Definition of Cancer. *American Journal of Medical Sciences*, 1920, clix, 781.

The following factors are analyzed as causes of cancer:

(1) *External Stimulation of a Mechanical or Chemical Nature.*—There seems to exist a graded series of transitions from the normal growth-energy of tissues to the increased growth-energy and motility of cancer. Each kind of tissue maintains, on the whole, the growth-energy characteristic of it, and this is one of the essential distinguishing features between cancer, benign tumor and normal tissue. There is abundant proof that long-continued irritation or even a single trauma may be an important factor in the origin of cancer.

(2) *Internal Chemical Stimulation, Especially Through the Action of Internal Secretion.*—The effect of hormones on the development of cancer is a specific one; a hormone influences the development of cancer only in those organs to which under normal conditions it has a specific relation. Castration has a definite influence on the origin of mammary cancer in mice, and it can be



shown that the influence of this hormone is a quantitatively graded one.

(3) *Heredity*.—Heredity plays a part in cancer of mice. Hereditary tendency to cancer does not follow the laws of simple Mendelian inheritance of monohybrid characters; but it can be explained according to Mendelian principles if we assume the presence of multiple hereditary factors. The inheritable tendency to cancer apparently consists in a tendency to develop cancer only in particular organs. Heredity is also a factor in the origin of human cancer, but interbreeding and perhaps other factors have obscured its significance. It consists in the presence or absence of chemical or mechanical growth-stimuli which originate within the organism, and produce cancer if combined with other growth-promoting factors.

(4) *Embryonal Character of Tissue or Disturbances of Embryonal Development*.—Young tissues grow more actively than older tissues, and the body fluids in younger organisms are more favorable to proliferating tissues than those of older individuals. Furthermore, an extensive migration of germ cells within the embryo takes place at an early stage of development. Thus some of the embryomata which we find in places far removed from the ovary may be due to such a migration of germ cells which failed to reach their proper place.

(5) *Age*.—Most tissues are constituted in such a way that within certain limits changes of environment call forth a response which indicates increased activity. Old age may place the cells in such a new environment.

(6) *Contact of Normal Tissues*.—Such contact with cancerous tissue may cause the transformation of the former into cancerous tissue. This has been observed in the case of spontaneous tumors of man and animals as well as in the case of transplanted cancers. It is possible that this is another instance of the stimulating effect which one tissue may normally have upon another.

(7) *The Possible Significance of Microorganisms*.—No unicellular microorganisms have been found in cancer; no agent can be separated from cells in mammalian tumors.

(8) *General Considerations*.—All the factors which by chemical or physical means increase the proliferative energy of cells may act as causes of cancer; factors within the cells may make them more



responsive to outer growth-stimuli. In many cases several of such factors must coöperate. Several of these factors are hereditarily transmitted in a certain graded quantity from generation to generation, while the other factors are variable and extraneous. All these factors have one characteristic in common: they all increase the growth-energy of normal tissues either directly, or indirectly, the latter by sensitizing the tissues to the action of growth-stimuli.

M. H. KAHN.

KRABBE, K. H.: Early Synostosis of the Epiphyses with Dwarfism in Pubertas Precox. *Endocrinology*, Oct.-Dec., 1919, iii, No. 4, p. 459.

In addition to the symptomatological diagnosis of pubertas precox, radiographic study of the epiphyses reveals that epiphyseal junctures close early and result in dwarfism; hence the question of therapy to prevent this closure is of importance. As a therapeutic experiment, the administration of thymus extract is proposed, on the basis that the thymus has an internal secretion which is antagonistic in effect to those of the ovary or testis.

L. C. JOHNSON.

McKILLOP, L. M.: The Early Diagnosis of Cancer of the Alimentary Canal. *The Medical Journal of Australia*, Oct. 11, 1919, ii, No. 15, p. 305.

The author gives a brief review of some of the important early manifestations of cancer in its various locations along the alimentary tract. In the stomach, particularly when the wall along the lesser curvature is affected, the symptoms may be extremely atypical. The roentgenographic appearance of the stomach in early cancer is unreliable for positive diagnosis. A careful history, proper interpretation of clinical symptoms, and gastric analysis after an Ewald test meal, are of greater value for diagnosis. In cases giving a previous history of peptic ulcer an exploratory operation is required, in the majority of cases, to determine the coëxistence of a malignant process.

Cancer of the colon is less malignant than cancer of any other portion of the tract, except the lip. Metastasis occurs late in the course. The earliest symptoms may be those of intestinal obstruction, but usually constipation, dyspepsia, and abdominal discomfort constitute the earliest symptoms.

Cancer of the rectum may occur in young individuals, and may exist for a considerable time without causing symptoms. A history of recently developed piles, in an elderly person, should always be suggestive of rectal cancer. Constipation alternating with thin mucopurulent stools, anemia, and a history of the passage of blood with the stools demand a careful digital and proctoscopic examination of the rectum.

An important early sign noted in cases of cancer of the tongue and floor of the mouth is lagging on the involved side when the tongue is protruded to the sound side.

II. WOLFER.

RATHERY, F., AND BORDET, F.: Vomiting of Pregnancy Treated by Adrenalin. *Proceedings Société médicale des hôpitaux de Paris*, June 4, 1920; reviewed in *La Presse médicale*, June 9, 1920, xxviii, No. 38, p. 377.

The authors treated a patient, whose vomiting was so severe and constant, that it resulted in a profound asthenia and acidosis. The usual methods of treatment failed. Under the influence of adrenalin, the vomiting stopped and food was retained. The adrenalin had no effect upon the blood-pressure.

S. KAHN.

HONELJ, J. A.: A Study of Multiple Cartilaginous Exostoses. *Archives of Internal Medicine*, June, 1920, xxv, No. 6, p. 584.

Four cases of this rare disease are described in detail by the author, and the 66 published cases are analyzed. In 2 of the cases studies of the calcium and magnesium metabolism were undertaken. Of these 2, one had advanced to the stage where the abnormal processes had become stabilized, while the other represented the active,

less advanced stage of the disease. The inactive case presented a normal calcium exchange, and excreted an excess of magnesium over the intake whether on a diet rich or poor in magnesium. The active case, however, displayed a distinct calcium loss when on a calcium poor diet. On a calcium rich diet, calcium is retained in the body to an extent not widely different from that in normal subjects. Some retention of magnesium was observed on a magnesium rich diet.

The condition presents a strong family tendency, a positive family history being obtained in over a third of the cases in which this was inquired into. It begins early in life, probably before birth. More males are affected than females. The long bones are most frequently affected, but the flat bones may also be involved. The bones of the face and cranium are but rarely attacked. Both epiphyses and diaphyses are involved. Malformations and deformities occur as a result of overgrowth at such points as interfere with the normal growth and direction of the bones.

The author suggests that a knowledge of the metabolism of this disease may supply an important therapeutic factor which could be utilized during the early stages of the disease.

T. HOWARD.

HAMPTON, H. H., AND WHARTON, L. R.: Venous Thrombosis, Pulmonary Infarction and Embolism following Gynecological Operations. *Gynecological Department of the Johns Hopkins Hospital: Bulletin of the Johns Hopkins Hospital*, April, 1920, xxxi, No. 350, p. 95.

In a review of 205 cases of femoral thrombophlebitis, the incidence of pulmonary infarction and embolism following all types of gynecological operations, both perineal and abdominal, was found to be about 1 per cent. Of the 205 cases studied 81 per cent followed abdominal operations, especially the removal of large pelvic tumors. In 66 per cent the vessels of the left leg were involved, in 24 per cent, the right, and in 9 per cent, of both legs. In one instance the vessels involved were in the left arm. Most of the thromboses occurred during the second and third week, and 30 per cent occurred between the twelfth and fourteenth day of convalescence. It was found and verified at autopsy that thrombosis can occur in

both the femoral and saphenous veins with no swelling of the leg. It has been further verified that thrombosis of a large peripheral vein may be present without any local signs or symptoms whatever.

The most serious complications of thrombophlebitis were pulmonary; fourteen patients, or 7 per cent, developed pulmonary infarcts and three, 1.5 per cent, pulmonary embolism.

Of 170 cases diagnosed as postoperative pleurisy, pneumonia or bronchitis, it was found that the diagnosis of post-operative pulmonary infarction was very frequently missed, since 34 cases were undoubtedly post-operative pulmonary infarcts.

Fifty one cases of pulmonary infarction and embolism were studied. Thirty-four were pulmonary infarcts and 21 were pulmonary emboli. Of 34 cases of infarction, 5 died; of the 21 cases of embolism, 19 died.

Only 10 per cent of the cases of pulmonary infarcts were recognized and diagnosed correctly. The authors believe such a poor record was due to a diagnosis which was practically always made upon the physical findings in the thorax instead of the whole clinical picture.

Under diagnosis the important points observed were:

*The Class of Case.*—Postoperative patients.

*Time of Occurrence.*—Usually in the second or third week.

*Temperature.*—Low and of the hectic type; not like that of pneumonia.

*Attack.*—Infarction makes its appearance with sharp pain over the ribs as the dominant symptom.

*Leukocyte Count.*—Usually between 1200 and 1800.

*Physical Signs.*—They are rarely present before the second day. The friction rub was noted in 75 per cent of the cases. Impairment and changes in the breath sounds appeared last and were noted in 63 per cent of the cases.

*Symptoms.*—Pain was predominant. Cough was present in 63 per cent and was not severe or very productive. Hemoptysis was present in 36 per cent. Phlebitis was present in 41 per cent.

*Embolism.*—Of the 21 patients having pulmonary embolism, 90 per cent died. Seventeen were autopsied and the most common source of emboli was found to be in the pelvic veins; in 15 per cent the origin was in the veins of the leg.

D. F. LAYTON.



## SECTION ON LABORATORY AND RESEARCH

FLOYD, C.: The "Common Cold" in Relation to Certain Micro-organisms and its Treatment with Bacterial Vaccines. *The Boston Medical and Surgical Journal*, April 15, 1902, Vol. clxxxii, No. 16, p. 389.

By "common cold" is meant the infection common in the winter, of the various respiratory passages. Much more attention has been paid to these infections because of the numerous epidemics during the last five years. Many observers thought that the Pfeiffer bacillus was the cause of practically all the winter infections of the upper respiratory tract. Other workers, while they occasionally found the Pfeiffer bacillus, have more often found the streptococcus and pneumococcus predominating. Bacteriologic investigation of the epidemic of 1915-1916 by Mathers, of Chicago, showed the *Streptococcus hemolyticus*, *Streptococcus viridans*, and pneumococcus predominating. In only 1 case, of 61 studied, was the bacillus of influenza discovered. Still others held a filterable virus responsible for infection. Pneumococci have been found in the Saliva in one-third of normal individuals. The present work concerns itself mainly with the relation of streptococcus and pneumococcus groups of organisms to the common cold, with the type of common cold in relation to the presence of one of the members of the streptococcus or pneumococcus groups, and with the study of the effect of the various vaccines in controlling these two types of infection.

Cultures were secured as early as possible after the onset of symptoms (within thirty-six hours). Cultures were taken from the turbinate region in cases of coryza, from the soft palate in cases of burning red throat, and from washed bits of tracheal or laryngeal secretions, where infection pointed to these locations. Aërobic and an-

aërobic cultures were planted in plain broth, acetic broth, litmus milk, blood-agar, dextrose agar and dextrose acetic agar.

Of 70 cases studied in 1913 and 1914, 16 showed initial infection in the tonsillar region; 40, in the uvula, and soft palate; 4, in the mucous membrane of the nose; and 10, in the larynx and trachea. In 1914 and 1915, of 35 cases, the predominating organism was the hemolytic streptococcus in 61; and the pneumococcus in 20. In a study of the cases of acute laryngitis and tracheobronchitis in 1915, 1916, 1917, and 1918, the pneumococcus (Type IV) was the predominating organism.

Clinically, the common cold may be divided into types as follows:

(1) Acute rhinitis, characterized by sudden swelling of the nasal mucous membrane, with a watery discharge, fullness in the head, and malaise. The organisms commonly found are of the staphylococcus group; less often the hemolytic streptococcus is isolated.

(2) Acute pharyngitis, followed by rhinitis and laryngitis. This type shows redness of fauces and posterior wall of the pharynx, pain on swallowing, dry cough, and temperature. Infection may extend to the nose or larynx. Invariably, the infection is caused by a member of the streptococcus group.

(3) Acute laryngitis, followed by tracheitis, bronchitis, and pneumonia. The pneumococcus (Group IV, or occasionally Groups I and II) predominate. Occasionally the hemolytic streptococcus is the original invader.

(4) Acute tracheitis, followed by bronchitis and laryngitis.

On account of the multiplicity of the organisms present in the mucosa of the nose and throat, it is futile to expect to find one organism as the cause of all the acute respiratory diseases.

A number of observations as to the use of bacterial vaccines in the treatment and control of acute colds, particularly in those people peculiarly susceptible to acute upper respiratory infection, has been carried out. The results, while unsuccessful in some instances, have shown that the severity and frequency have been modified in the majority of cases. In some individuals practical immunity from acute respiratory infections has been secured.

*Conclusions.*—The results of many recent observations point to the members of the streptococcus and pneumococcus groups as the

predominating organisms causing infections of the upper respiratory tract.

The classification of the common cold as outlined is suggested, as it rests on a fairly constant bacteriological basis.

The production of active immunity by the use of appropriate bacterial vaccines promises to be of value prophylactically in the control of infections of the upper respiratory tract.

M. M. BANOWITCH.

FABER, K., AND NORGAARD, A.: Glycosuria and Glycemia. *Congrès français de médecine*, xiv; reported in *La Presse médicale*, June 5, 1920, xxviii, No. 37, p. 367.

In the production of a glycosuria, two factors have to be considered—the amount of sugar in the blood, and the ability of the kidneys to excrete the sugar after a certain threshold has been passed.

The authors have studied 32 diabetics, with the purpose of determining this threshold of glycosuria. They have found it to vary between 0.09 per cent and 0.19 per cent blood sugar. In most of the cases, the blood sugar was 0.14 per cent to 0.17 per cent before the glycosuria appeared.

The amount of blood sugar in diabetics which results in a glycosuria, is independent of age and sex and the duration of the disease. The more the threshold tends to approach the normal, the more easily is it passed, and the more often does glycosuria appear.

S. KAHN.

TECON, H.: The Sun as Sterilizing Agent of the Tuberculous Sputum Expectorated on the Streets (De la valeur du soleil comme facteur de sterilisation des crachats tuberculeux expectorés sur la voie publique.) *Paris médical*, Paris, Jan. 3, 1920, x, No. 1, p. 33.

The author has made a series of experiments to determine the sterilizing action of the solar rays upon the sputum. During the experiments the kind of soil upon which the sputum fell, as well as the meteorological changes, were carefully noted. The sputa

used came from patients that were well known by the author. All of them had been examined under the microscope previous to the submission to the action of the sun. The sputa fell from a distance of sixty cm. Tecon divides his experiments into two groups.

*First Group.*—The sputa fell on ordinary country road soil, on Alpine roads in summer. The sputa exposed to the action of the sun during a period of time varying from two to fifty-two hours and fifteen minutes all gave positive results when injected into guinea pigs. In some cases the tuberculous infection did not appear until after a certain time.

*Second Group.*—The sputa fell on ground snow, on Alpine roads during the snow season. All the sputa that fell on this kind of soil were sterilized in less than twenty-nine hours.

The remarkable difference of temperature between day and night must be kept in mind when considering these experiments. The author gives two comparative tables in which the results are explained in detail. The sterilizing action of the sun is more active when the sputum falls on a thin layer; but on thick clumps of sputum the action of the solar rays are almost *nil*.

C. F. ARROYO.

ALLEN, R. W.: Tuberculin "M": The Ideal Tuberculin for the Treatment of Tuberculosis. *British Journal of Tuberculosis*, Oct., 1919, xiii, No. 4, p. 170.

On reinvestigation of the subject of tuberculins the conclusion is reached that, at present, they all possess certain inherent defects, due to (a) deficient content of therapeutically active non-toxigenic protoplasmic antigen; (b) an excessive content of toxigenic antigen or antigens; or (c) a combination of both. He states that it is easy to see that the administration of dosages of bacillary protoplasm sufficient to induce antibody formation may be impossible if the tuberculin contains toxins sufficient to induce reactions. Such toxins are products of the bacillary metabolism derived from the culture medium itself, especially if this contains protein ingredients. In an ideal tuberculin such constituents would be excluded.

Tuberculin A.F. (i. e., albumin-free) has proved safe clinically, but its main disadvantage is its lack of an adequate amount of anti-



gen derived from bacillary protoplasm. Thus tuberculin A.F. contains (a) exotoxin, if the tubercle bacillus forms any, (b) endotoxin liberated by autolysis of a few bacilli, and (c) very small quantities of broken-down bacillary protoplasm formed from the autolyzed bacilli. Using this tuberculin as a base and adding to it the required protoplasm in a suitable form would produce a tuberculin capable of inducing the formation of antitoxins as well as of bactericidal and lytic antibodies.

The greatest impediment to artificial immunity lies in the difficulty with which the bacilli are lysinized, an essential preliminary to the elaboration of antibodies. The author decided to imitate the natural process and lysozyme the bacilli in an alkaline medium, thereafter subjecting them to oxidation and hydrolysis, which is probably the next stage in the tissues. This was accomplished by removing the fats and waxes with solvents and then subjecting the bacilli to the very slow action of dilute hydrogen peroxid, and after careful neutralization, by diluting with normal salt solution containing 0.3 per cent tricresol until 1 c.c. contained 20 mg. of the original dry bacilli. By the addition to this of an equal bulk of tuberculin A.F. the new tuberculin "M" is constituted.

Thus it contains: (a) exotoxin, which the bacilli tubercle may form, growing in a proteid-free medium, (b) endotoxin liberated by autolysis of dead bacilli, (c) broken-down protoplasm formed by this autolysis, (d) bacillary protoplasm and endotoxin in considerable amounts after lysozymization, oxidation, and hydrolysis.

It contains no non-specific toxins, which may give considerable reactions while the bulk of the specific toxins have been subjected to oxidation and hydrolysis, as must occur in the body prior to the elaboration of, specific anti-endotoxins. This tuberculin is practically "atoxic" or "detoxicated".

After giving several hundred doses the author finds that in every case there has been steady improvement in clinical signs and symptoms. In each case of completed treatment, the total disappearance of tubercle bacilli has apparently been induced. He points out that:

(1) Tuberculin "M" is perfectly safe, being devoid of unaltered toxins.

(2) It possesses powers of inciting the antibody formation necessary to destroy the invading tubercle bacilli.

(3) It has an antigenic value superior to that of any other tuberculin.

(4) It is well adapted to the treatment of dispensary cases and of those not in institutions.

(5) A safe initial dose for an adult with chronic or subacute tuberculosis is .0001 c.c.

(6) The dosage and intervals must be controlled by the focal reactions induced.

(7) An ultimate dosage of from 0.4 to 1 c.c. can and should be attained as a rule.

C. F. NICHOLS.

TEALE, F. H. AND EMBELTON, D.: Studies in Infection. II. The Paths of Spread of Bacterial Exotoxins with Special Reference to Tetanus Toxin. *Journal of Pathology and Bacteriology*, Oct., 1919, xxiii, 50-68.

The tetanus toxin ascends to the central nervous system by way of the axis cylinders of the nerves and also by the perineural lymphatics. By blocking the lymphatics it is possible to delay, and in some cases even to prevent the effect of the toxin in the nerve whose lymph paths have been blocked. The toxin passes out into the connective tissue spaces from the blood-vessels and from there to the thoracic duct. However, from the capillaries of the central nervous system, the toxin does not pass into the nerve-tissue, nor does it pass from the choroidal plexus to the spinal fluid. Like colloidal pigments the toxin does not pass through the posterior root ganglion to the cord. Iodised tetanus toxin, when introduced subcutaneously or intravenously, does not produce tetanus, but introduced intracerebrally it produces tetanus with typical symptoms. Tetanus antitoxin does not pass into the central nervous system by any of the routes taken by the toxin. It cannot pass from the spinal fluid into the substance of the cord. Antitoxin simply acts by combining with circulating toxin, and the toxin at the seat of production, and prevents it from reaching the central nervous system. The toxin, once it has reached the central nervous system, is not affected thereby.

F. HULTON-FRANKEL.

VALENTINE, E. AND COOPER, G. M.: On the Existence of a Multiplicity of Races of *Bacillus influenzae* as Determined by Agglutination and Agglutinin Absorption. *The Journal of Immunology*, 1919, iv, 359.

The authors studied a large number of cultures of *Bacillus Influenzae* isolated from cases of influenza which occurred in the 1918-1919 epidemic. The purpose of the investigation was to find evidence of the existence of a single "strain", which could be looked upon as the specific etiological factor in influenza.

The identification of such a specific or "epidemic strain" would require the isolation of identical cultures from a reasonable number of individuals affected with the disease, who could be shown not to have been in contact with one another. Actually, the results of this study failed completely to reveal any such strain; no identities in the different cultures were encountered, except where recent contact or other means of direct transfer of the strain seemed likely.

The striking conclusion of this highly important contribution is that *Bacillus influenzae*, as far as we can judge this organism at present, "is not the primary etiological agent in epidemic influenza."

A. F. COCA.

FLEXNER, S., AND AMOSS, H. L.: Experiments on the Nasal Route of Infection in Poliomyelitis. *The Journal of Experimental Medicine*, Feb., 1920, xxxi, No. 2, p. 123.

The experiments given in the paper relate to the conditions underlying the stages of susceptibility and refractoriness to infection with the virus of poliomyelitis applied to the nasal mucosa.

Certain monkeys are highly refractory to inoculation via the nares with the virus of poliomyelitis, apparently in virtue of the power possessed by the nasal mucous membrane to destroy or otherwise render ineffective the virus applied to it. This property of the nasal mucosa appears to be distinct from any specific protective substance in the blood acting upon the virus. An effective nasal mucous membrane will prevent the passage of the energetically applied virus to the brain and spinal cord.

The virus of poliomyelitis, energetically applied to the nasal



mucosa, will survive for an undetermined period of time upon an ineffective, but for a relatively brief period upon an effective membrane. The protective power possessed by the mucosa is not in itself adequate to prevent infection with the virus introduced into the nose, since slight injury to such independent structures as the meningeal-choroid plexus complex favors the passage of the virus from the nose to the central nervous organs.

The normal nasal mucosa is an invaluable defense against infection with the virus introduced upon it, and the number of healthy and chronic carriers of the virus is probably determined and diminished by the protective activities of this membrane. Antiseptics applied to the mucosa upon which the virus has been deposited exhibit no great protective action and are of doubtful value. They may even affect unfavorably the destructive action of the nasal mucosa.

Infection with the virus of poliomyelitis applied to the nasal mucosa under conditions favorable to the extension to the central nervous system and multiplication there may be blocked or prevented by the injection of poliomyelitic immune serum into the blood. It seems probable that the meeting-place of the virus and the immune serum is in the subarachnoid space.

H. M. FEINBLATT.

MUNRO, W. T.: Treatment of Cerebrospinal Fever by Monotypical Serum. *British Medical Journal*, Mar. 27, 1920, No. 3091, 430.

The report covers 12 consecutive cases; those treated with a monotypical serum all recovered. Gordon has shown that 98 per cent of all cases of cerebrospinal fever fall into one of four types. Of those cases which have been typed, 40 per cent are Type 1, 42 per cent are Type 2, 16 per cent Type 3, and 2 per cent belong to Type 4. If a case of suspected meningitis should show a cloudy fluid, 60 c.c. to 70 c.c. of the fluid would be withdrawn, and 40 c.c. to 50 c.c. of a pooled serum would be injected intrathecally. This pooled serum should consist of serum with equal parts of antibodies of Types 1 and 2, since four-fifths of all cases fall into these divisions. The spinal fluid is at once examined for diplococci, and



planted on at least four tryptagar plates. The following morning there is sufficient growth to carry out the typing procedure. Type 2 is the most virulent, is most frequently associated with a rash, and a confluent rash with many extracellular organisms is of grave significance. In a relapse when improvement is slow, vaccine treatment may help. No patient, who lived long enough for the type to be determined and who had monotypical serum, died. It is evident that early typing and use of monotypical serum promise the best chance for recovery.

L. C. JOHNSON.

MONZIOLS AND COLLIGNON: Interesting Clinical and Epidemiological Observations Made in Constantinople During the Plague Epidemic of 1919. *Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, Feb. 13, 1920, xxxvi, No. 5-6-7, pp. 215-217.

Despite the severity of the epidemic, the number of positive blood cultures was small—16 per cent. Eighty-six per cent of patients with positive blood cultures died.

Septicemia may precede the appearance of buboes. The mortality rate varies with the location of the buboes—cervical, 66 per cent, axillary, 100 per cent, inguinal, 28 per cent.

Rats are the original source of infection.

The rats which were found dead all belonged to the "*mus ratus*" species. One rat had been partially eaten by the others.

The fleas found on the rats were usually of the *Xenopsylla cheopis* species.

S. KAHN.

WEAVER, G. H., AND MURCHIE, J. F.: Contamination of the Hands and Other Objects in the Spread of Diphtheria. *Journal of the American Medical Association*, Dec. 27, 1919, lxxiii, No. 26.

The writers call attention to their studies of the means by which crossed infections may occur in hospitals for contagious diseases.

They studied the hands of pupil nurses, of specially instructed nurses, and of interns, for two forms of bacteria, the diphtheria bacillus and the hemolyzing streptococcus. This was done to determine whether ordinary soap and water cleansing is efficient. Cultures were also made from door-knobs. Of 268 cultures made from beneath the nail and from the palmar surface of the right index finger, 25 contained hemolyzing streptococci, and 8, diphtheria bacilli. No individual from whom 10 or more cultures were made failed to show the streptococcus. Fifty-one cultures from specially trained nurses gave but one positive result, while 3 from interns gave varying positive findings. The authors conclude that soap and water cleansing must be unusually thorough to be effective. They suggest that the use of rubber gloves will most likely prove most effective in preventing such contamination.

H. G. WEBSTER.

BESREDKA, A.: Oral Vaccination Against Typhoid. *Bulletin de l'Institut Pasteur*, Dec., 1919, xxxiii, No. 12; reported in *La Presse médicale*, Apr. 17, 1920, xxviii, No. 23, p. 229.

In this experimental work, Besredka studied:

- (1) Vaccination by means of living virus.
- (2) The properties of the serum of those vaccinated *per os*.
- (3) Vaccination by means of dead virus.
- (4) The mechanism of the immunity acquired by oral vaccination.

It is known that subcutaneous vaccination confers an immunity which is much inferior to that acquired after typhoid fever contracted *per os*. In rabbits, however, oral infection by means of living virus confers no immunity. This is contrary to what occurs in mice. But if the rabbit is given some bile in its food previous to the oral inoculation, the animal acquires an immunity.

The examination of the serum of rabbits vaccinated *per os*, by means of living virus, shows the same antibodies as if the vaccination were by any other route. But the immunity does not depend upon the presence of these bodies in the serum, because, although these bodies disappear, the immunity remains.

The ingestion of living virus without bile results in the production of antibodies, without a consequent immunity. The ingestion of dead virus with bile produces an immunity, without the presence of antibodies.

The ingestion of living virus produces marked agglutinating properties in the serum. The agglutinins produced were much less marked in those rabbits which had been given bile and dead virus also, due to the lessened permeability of the intestines to the antigen. The intestinal impermeability is an evidence of local vaccination. The rabbit whose intestine is impermeable to typhoid or paratyphoid bacilli is considered vaccinated.

The immunity following vaccination *per os* appears very quickly. Artificial, as well as natural, immunity, depends chiefly on the intestinal wall. The mechanism of the immunity can be explained by the barrier which the intestinal mucosa presents to the virus—by preventing the virus from permeating the intestinal wall.

S. KAHN.

BIGELOW, E. B., AND BERG, G. L.: A Milk-borne Epidemic of Typhoid Fever and the Demonstrated Value of the Widal Reaction in Detecting a Typhoid Carrier. *The Boston Medical and Surgical Journal*, May 6, 1902, clxxxii, No. 19, p. 481.

An epidemic of typhoid occurred in Worcester in October, 1919. The first 6 cases occurred upon the milk-route of one particular distributor. His family and employees were not sick, gave no histories of typhoid and their Widal reactions were all negative. This distributor secured his milk from 39 dairies outside of the city limits. Two hundred and five persons lived on these dairy farms. Eight gave previous histories of typhoid, and 4 were sick. One was definitely diagnosed as a case of typhoid but as the onset of symptoms corresponded in length of time to the cases in Worcester, this could not be regarded as the source of the epidemic. The Widal reactions of the 8 who had typhoid previously were investigated; 7 were negative and one positive in the 1-50 dilution. Typhoid bacilli were recovered from the latter's feces but not from his urine. He gave a history of typhoid in 1906. On investigating further it was found that customers on his route had had typhoid as follows: in

1907 his wife and daughter were ill and among his customers there were 2 cases. In 1908 there were 2. In 1911 and 1912 there were 2 each. In 1913 there were 6 local cases and 28 in a distant community which received his milk. The point of interest is the value of the Widal reaction as an aid in detecting the typhoid carrier.

M. M. BANOWITCH.

BARACH, J. H.: Leukocytes in Anaphylaxis of Serum Sickness. *The Journal of Laboratory and Clinical Medicine*, Feb., 1920, v, No. 5, p. 295.

In a case of serum sickness with a delayed anaphylactic reaction recorded by Barach, the blood showed, at the time of the anaphylactic reaction, a primary polymuclear leukocytosis, followed by the appearance of myelocytes, after the organism had appropriated the available leukocytes of the circulating blood, and at the same time an increased number of blood-platelets. A leukopenia followed, at which time the polymorphonuclear counts were low and the number of mononuclears relatively high. The eosinophilia, which has been said to accompany anaphylactic reactions in general, was absent throughout. The author concluded, therefore, that eosinophilia is not a criterion of an anaphylactic reaction.

C. M. ANDERSON.

HISANOBU, K.: On the Distribution of the Non-protein Nitrogen in Cases of Anaphylaxis and Peptone Poisoning. *American Journal of Physiology*, 1919, 1, 357.

The author first outlines two theories as to the cause of anaphylaxis: (a) that a protein poison is responsible, and (b) that the antibody is within the cells and that the antigen antibody reaction occurs there rather than in the blood stream. He then cites the experiments of Zunz and Gyorgy in which they claim a definite increase in amino-acids during acute shock, the experiments of Johnson and Peterson, in which they note also an increase of non-coagulable blood-nitrogen in addition to that of amino-acids, and the experiments of Whipple and Van Slyke on the effect of proteose intoxication upon nitrogen-



ous products of the blood. His own investigation is carried out to see whether there is a similar increase in the non-protein nitrogen and amino-acids in anaphylaxis. He finds that peptone intoxication is associated with a marked increase in urea nitrogen and also more or less in non-urea and amino nitrogen, confirming the Whipple-Van Slyke results with proteose. The changes in the nitrogenous constituents of the blood in anaphylaxis are similar to those of peptone intoxication, but more intense. Both anaphylaxis and peptone intoxication lead to an abnormally rapid autodigestion of tissue protein, and the causes are probably the same although they are as yet undetermined.

W. H. EDDY.

HANZLIK, J., AND KARSNER, H. T.: Effects of Various Colloids and Other Agents which Produce Anaphylactoid Phenomena on the Bronchi of Perfused Lungs. *The Journal of Pharmacology and Experimental Therapeutics*, Feb., 1920, No. 6, pp. 449.

Guinea pigs weighing about 400 grams each were used. Normal saline (0.9 per cent NaCl) was used as the vehicle for the drugs, and the lungs were perfused according to the method of Baehr and Pick. Complete distention of the lungs in the inspiratory phase, holding permanently, was taken to mean bronchoconstriction.

The following drugs were found to produce no peripheral bronchoconstriction; acacia, althea, arsphenamin, Congo-red, dextrin, gelatin, glycogen, nuclein solution, and starch. Whatever inflation the agents did produce in the intact animal seemed to be due to central action from circulatory asphyxia. Perfusion with agar sol. gel. (1-6) resulted in prompt and marked distention of the lungs and stoppage of the perfusion flow, due to the massing of agar emboli in the pulmonary vessels. These effects could not be antagonized by papaverin and atropin. The distention from the agar is not due to a passive bronchoconstriction by compression of the bronchioles on the part of emboli in the pulmonary vessels. This passive bronchoconstriction is also the chief mechanism in the marked pulmonary inflation produced by agar in the intact animal, whose pulmonary vessels invariably contain thrombi.

H. M. FEINBLATT.

HANZLIK, P. J.: 2. Effects of Various Colloids and Other Agents which Produce Anaphylactoid Phenomena, on Surviving Intestine and Uterus. *The Journal of Pharmacology and Experimental Therapeutics*, Feb., 1920, xiv, No. 6, pp. 463-478.

The effects of the various agents, which were added to surviving strips of rabbit and guinea pig intestine, and of virgin uterus, were studied by making tracings of the movements of the organs upon a slowly moving kymograph. The concentration of the agents used was varied from the concentration occurring in the blood after intravenous injection as employed by the author in his experiments on systemic action, up to very high concentration, to see whether or not any augmentor effects could be noted.

Agar sol. and agar. gel. were found to produce either no effect or slight depression of peristalsis of both the surviving intestine and uterus. The following agents in high and low concentrations uniformly depressed the peristalsis: acacia, dextrin, glycogen, gelatin, starch, human and horse serum, nuclein solution, and althea extract. Peptone and rabbit's serum, which were used as controls, showed moderate or marked stimulation. Beef serum reacted irregularly, while Congo-red, in low concentration, produced marked stimulation, which finding did not agree with the results obtained upon the bronchi of perfused lungs.

H. M. FEINBLATT.

LUCKIESH, M.: Infra-red Radiant Energy and the Eye. *American Journal of Physiology*, 1919, 1, 383.

The speculation that irritation and fatigue in the eye are largely due to the thermic effect from the absorption of infra-red radiant energy by the eye media is cited, as well as also the view that eye glasses should not transmit infra-red radiation. The author shows that the idea lacks substantiation, and presents a review and criticism of the data upon which the speculation is based. He presents data to show in what relative quantities energy is absorbed in various parts of the eye and what the energy density in the path of the useful beam of radiation is. He does so in order that those interested in eye fatigue and cataract may have available quantitative data.

W. H. EDDY.

## SECTION ON PEDIATRICS

MORSE, J. L.: A Résumé of the Literature on Infantile Scurvy During the Past Two Years. *The Boston Medical and Surgical Journal*, April 22, 1920, clxxxii, No. 17, p. 428.

Since Morse's previous publication summing up the literature of the five years preceding 1918, much work has been done and reported in the literature of the Allies. Undoubtedly a considerable amount has also appeared among the Central Powers, but this is not yet available.

In 1918 McCollum stated that scurvy was not due to lack of an antiscorbutic substance in the food, but to the absorption of abnormal decomposition products of proteins. He believes that scurvy in guinea-pigs is due to the stagnation of feces in the cecum, and to the absorption of the toxic products of abnormal decomposition of food. He cites the excellent results of laxative treatment in these animals. Inasmuch as rats do not develop scurvy on a diet which produces it in guinea pigs, he thinks that scurvy is not due to the lack of the antiscorbutic element in the food. If scurvy were due to such a deficiency, it must be assumed that guinea pigs require some chemical complex in the food which the rat does not. But this is not reasonable, because the experimental evidence points to the conclusion that the chemical requirements of one species of higher animals are the same as those of another.

Jackson has endeavored to corroborate her former work as to the action of microörganisms in the etiology of scurvy, but the writer regards them as secondary invaders which have nothing to do with the cause of scurvy.

Harden and Zilva criticize McCollum's conclusions because whole milk was given freely to the animals under experimentation. It is well-known that if enough whole milk is taken, scurvy does not de-

velop; the improvement in the animals was probably due to the milk.

Cohen and Mendel investigated the relation of constipation to scurvy in guinea pigs. In autopsies on normal pigs, or those which had died from causes other than scurvy, they never found one in which the cecum was not full, or partly full of feces. Impaction of feces in the cecum was found in a fourth of nearly 1000 guinea pigs which had died from scurvy; there was visible damage to the intestinal wall in one-half. Milk is a constipating diet to guinea pigs and they develop scurvy when fed on small amounts of milk; but if larger amounts are taken, scurvy disappears; this proves that constipation is not the cause of scurvy. The addition of course material to the diet did not prevent scurvy, even when constipation was avoided. The authors conclude that the simultaneous exhibition of constipation and a certain symptom-complex with a given diet is no evidence that constipation is responsible for the appearance of the symptom-complex.

Hess and Unger state that macroscopic lesions do not justify a diagnosis of scurvy in guinea pigs, as scurvy and rickets both appear macroscopically. Microscopical examinations must be made. For this reason the work of McCollum and his school is open to question. Hess and Unger found that cod-liver oil prevented constipation but did not prevent scurvy. Liquid petrolatum was given to guinea pigs to keep the bowels loose; but scurvy developed.

Rappleve fed guinea pigs on milk and oats. They developed scurvy and their ceca were distended with pale pasty feces. They improved under phenolphthalein. Guinea pigs fed on hay and oats also developed scurvy, but their intestines appeared normal. Putrefaction was less marked and stools were not abnormal. Laxatives helped these animals. He concludes that scurvy in guinea pigs is not due to impaction of feces.

Chick and his co-workers also criticize the conclusions of McCollum because no attention was paid to the amount of milk taken by the animals. They show that those animals which survived took a great amount of milk and but little grain; and those that did not survive took much grain and little milk. They say that all guinea pigs with scurvy are constipated regardless of the diet. They gave large quantities of dried vegetables, well cooked in water, in order to restore the food's bulk, but this did not prevent scurvy; this indicates that when scurvy develops upon a diet of dried vegetables, it



is not constipation caused by the lack of bulk in the dried vegetables which causes scurvy. Liquid paraffin given with the usual diet did not prevent scurvy, and, when it was added to the diet after scurvy developed, it did not influence its course.

Hess found that constipation plays no rôle in the etiology of infantile scurvy. Potatoes are not laxative, yet they cure scurvy; and malt-soup preparations are laxative, yet they easily induce scurvy. On the other hand, scurvy is relieved by amounts of orange juice so small that it has no laxative action. "Artificial orange juice," found effective in the scurvy of guinea pigs, was not effective in infantile scurvy. Again, orange juice given intravenously is just as effective as that given by mouth; and orange juice given intravenously can have no laxative action.

Pitz, knowing that in rats and men the bacterial flora could be changed from a putrefactive to an acidophilous flora by the addition of lactose to the diet, argued that any substance which would do so should prevent scurvy. He therefore fed guinea pigs on oatmeal and whole milk to which he added a carbohydrate diet. He believes that, by adding lactose, he was able to cure and prevent scurvy. But, since whole milk was given *ad libitum*, his conclusions are open to just criticism.

Cohen and Mendel found that the addition of pure lactose neither prevented nor cured scurvy.

Hardeu and Zilva also found that cane sugar, fructose, and syrup had no antiscorbutic value. They believe that Pitz's results were due to the free use of raw milk. Hess found that the feeding of eggs and cod-liver oil (food containing fat soluble A) did not prevent scurvy. A diet of hay, oats, and water (food containing sufficient water soluble vitamins) did not prevent scurvy. Cohen and Mendel added yeast and butter to a diet causing scurvy in guinea pigs; this did not prevent the development of scurvy. This proved that neither fat soluble nor water soluble vitamins are concerned as primary factors in the scurvy of guinea pigs.

Gerstenberger "imagines" that scurvy is due to a partial de-functioning of calcium and its physiological anion as the result of a break in the metabolism of carbohydrates caused by the absence or inactivity of some physiochemical substance or vitamin. The substance may be oxalic acid or any other agent having a strong affinity for calcium.

Pitz found that the addition of casein or meat would prevent scurvy for weeks and thereby prolong life. The addition of tricalcium phosphate increased the protection and the addition of sodium chlorid still further increased it. Calcium was more important than phosphorus. He explains that calcium controls the permeability of various animal tissues, and thus affords protection against invading agents. However, his animals were given milk *ad libitum*, and no microscopical examinations were made.

Chick, Hume, and Skelton found that from 30 to 50 c. c. of fresh cow's milk daily did not prevent scurvy in guinea pigs which were taking a diet causing scurvy. However, 50 c. c. afforded some protection; 50 to 80 c.c. increased the protection; and 100 to 150 c.c. gave complete protection. This leads to the conclusion that the quantity of milk is the important factor. The writers believe that fresh milk contains a small amount of an antiscorbutic accessory substance. Milk must constitute the whole or almost the whole of the diet, if it is to be a protective agency.

Barnes and Hume in comparing the antiscorbutic values of dried and heated cow's milk, found that from 100 to 150 c. c. of raw milk will prevent scurvy in guinea pigs. Similar amounts of dried milk did not prevent scurvy; 125 to 175 c. c. of raw milk prevented scurvy in monkeys, while from 200 to 300 c. c. of dried milk were necessary to produce like results; 175 c. c. of dried milk caused scurvy in monkeys, while 175 c. c. of raw milk completely cured it. Scalded milk had greater antiscorbutic value; 200 c. c. of scalded milk daily quickly cured scurvy in a monkey.

Lemon and orange juice cured scurvy for the writers. Hess found the artificial orange juice of McCollum ineffective in infants and guinea pigs.

Harden and Zilva believe that the main part of the antiscorbutic potency of lemon juice is contained in the residue after the removal of the free citric and other acids. This can be concentrated or evaporated to dryness without loss of potency. It is advantageous because large amounts may be given. The equivalent of from 6 to 12 lemons was given daily without gastrointestinal disturbance.

Hess and Unger found that aging and heating had practically no effect on the antiscorbutic power of orange juice.

Neutralization of orange juice did not affect the antiscorbutic

power, but when it was made N/20 alkaline with NaOH and stored twenty-four hours in a cold room, it did not prevent or delay the onset of scurvy in guinea pigs.

Givens and McClugage used two preparations of orange juice; one was dried instantaneously, while the other was dried slowly for fifty hours. An equivalent of 3 c. c. of fresh orange juice of the rapidly prepared preparation prevented scurvy in guinea pigs and also cured them after the disease had developed. Whereas 12.5 c. c. of the slowly dried preparation was necessary to prevent or cure scurvy. Neither preparation was injured by aging for three months.

Hess and Unger used orange juice intravenously and cured scurvy in infants. Injections containing as much as 30 c. c. were used and were just as effective as when they were given orally.

Preserved lime juice was useless in preventing scurvy in guinea pigs and monkeys, and fresh lemon juice was four times as potent as fresh lime juice (Chick, Hume and Skelton).

Raw juices of root vegetables were used by Chick and Rhodes as a basal diet for guinea pigs. This was prepared fresh daily. The juice of raw swede was first in antiscorbutic power; 2.5 c. c. daily protected the animals from scurvy. Pigs getting from 5 to 10 c. c. of raw carrot juice daily developed scurvy, while those getting 20 c. c. daily were protected; 20 c. c. of beet juice afforded no protection. Raw swede juice is a capable substitute for orange juice. The writers found that 1.5 c. c. of fresh orange juice protected 50 per cent of the guinea pigs, while 3 c. c. protected all of them.

Delf proved that 1.5 grams of raw cabbage prevented scurvy, while 0.5 gram did not. Campbell and Chick found that 5 grams of canned cabbage daily did not protect guinea pigs, while 7.5 grams did. Cabbage dried at low temperature retained some of its antiscorbutic value (Givens and Cohen), but when it was dried at high temperature, or when it was cooked and dried, all of its antiscorbutic property was lost. Fresh carrots are strongly antiscorbutic, but when they are dried they are inert (Hess and Unger).

Boiled potatoes have strong antiscorbutic properties in infants (Hess), but when they are dried and boiled, they lose all their antiscorbutic value (Givens and Cohen). Desiccated potatoes neither cure nor prevent scurvy (Stefansson).

Campbell and Chick observed that 5 grams daily of raw beans pre-

vented scurvy, whereas 20 grams of canned beans did not prevent it.

Hess and Unger fed strained canned tomatoes to babies for one and one-half years and found this diet as effective as orange juice in the prevention of scurvy. Prune juice has no antiscorbutic power in guinea pigs and infants (Stefansson).

Bananas are ineffective (Hess and Unger); and green Spanish grapes, even in considerable amounts, likewise have no effect (Chick and Rhodes).

The antineuritic and antiscorbutic elements are independent (Harden and Zilva). A diet high in antineuritic element, but deficient in antiscorbutic element, produced scurvy in a monkey. A diet containing neither antineuritic nor antiscorbutic element also produced scurvy. Likewise, a diet containing the antineuritic, but no antiscorbutic element, produced scurvy in a monkey, however, the animal was easily cured by "treated" orange juice.

Hess and Unger call attention to the fact that the alkalization of orange juice destroys its power to protect guinea pigs. It is, therefore, important to observe whether foods of infants are alkaline or not. Milk formulas containing malt-soup have an exceptional tendency to bring about scurvy. This is due to a number of conditions: an insufficient amount of milk; pasteurization, boiling, or both; aging of the milk; the alkali in the malt-soup; the large amount of carbohydrate in the food. In order to determine which is a factor, experiments were conducted upon a baby and guinea pigs and it was concluded that the scurvy was not due to the alkali directly, but to the action of the alkali upon the antiscorbutic property of the milk.

Stefansson found that the men in the Arctic Expedition (1916-1917), who had scurvy, had an unusual craving for salt and he thinks that salt may play a part in the etiology of the disease. Raw meat was the best and surest preventative and cure; fresh cooked meat will probably prevent but not cure scurvy. There was no relation between bodily cleanliness, ventilation and scurvy. Exercise did not cure the disease.

M. M. BANOWITCH.



PHILIP, J. A.: Two Cases of Pancreatitis (Acute and Chronic).  
*Archives de médecine des enfants*, Paris, 1920, xxiii, 357.

The first patient, a girl of seven years, suddenly developed vomiting and severe abdominal pain, which localized to the umbilicus. This condition grew worse, the temperature became subnormal and the pulse rose to 104. For three days there were no stools or gas. An elongated transverse tumor, painful on palpation, the size of a mandarin orange could be palpated in the mid-line above the umbilicus. The child died in spite of a laparotomy. At autopsy there was no peritonitis. It was found that the epigastric tumor had been caused by a very large and hard pancreas. There was no concomitant chronic lesion of the gall-ducts.

The second patient, a boy of ten years, had had since the age of two years attacks of epigastric pain every two or three months. These attacks were followed by bile-stained vomiting. There was no radiation of the pain to the right shoulder. When seen by the author in one of these attacks, a large painful mass could be felt in the epigastrium; the temperature was normal and the pulse, 60. The pain rapidly became worse and there were signs of occlusion. Laparotomy revealed an enlarged, indurated pancreas and a large bile-containing sac the size of a baby's head attached to the under surface of the liver and the duodenum. This was opened and drained. The bile was infected with streptococci. The child died ten days later. Necropsy demonstrated that this sac was a greatly dilated gall-duct. There were miliary superficial abscesses on the anterior border of the liver, and empyema of the gall-bladder. There were no stones. The pancreas was large and indurated and its ducts were much dilated. This latter case supports the theory of the biliary origin of pancreatitis, while the former one disproves it.

W. C. DAVISON.

APERT, E.: Opothrapy in Pediatric Practice. *La Presse médicale*, May 29, 1920, xxviii, No. 35, pp. 341-2.

Besides the well-known effects of the glands of internal secretion on metabolism, circulation, the secretions and cerebral activity, they exert a very important influence on growth and development. This

is especially true of the growth of the hair, the genitals and the secondary sexual characteristics. The latter effects are most marked when the subjects are very young.

The thyroid stimulates sexual development and growth without deviation from the normal type.

The adrenals stimulate the development of the primary and secondary sex characteristics. Their most marked effect is upon the growth of hair. They tend to produce virility and obesity.

The hypophysis stimulates growth in height, and results in arrested development of the sex organs.

Thyroid extracts should therefore be employed when there is retardation of the general development of the child in height, dentition, language, intelligence and sex organs.

Adrenal therapy is indicated in weak, apathetic children who tend to be very tall, and in those boys who are feminine in type.

Hypophyseal therapy should be employed in subjects who are obese, and hairy and who have a tendency to a precocious puberty.

S. KAHN.

BAUMGARTNER, E. A., AND OLSON, H. H.: Purulent Typhoid Meningitis. *Archives of Internal Medicine*, May, 1920, xxv, No. 5, p. 537.

A boy of six years suffering from fever, delirium, diarrhea, and melena, and showing a normal leukocyte count, developed an acute cholecystitis, and was operated upon seventeen days after the beginning of his illness. Five days later his neck became stiff and his head was retracted, he became incontinent, and an otitis media was discovered. The following day he suffered from a convulsion and twitching, and showed definite signs of meningitis. Puncture showed a turbid fluid containing 400 cells, mostly mononuclears, and the Eberth Bacillus. He died the next day. Autopsy showed a typhoid meningitis and surprisingly little evidence of intestinal typhoid. The authors analyze 37 cases of purulent typhoid meningitis taken from the literature on the subject. All the cases were fatal.

T. HOWARD.

SECTION ON  
ROENTGENOLOGY AND ELECTRO-  
THERAPEUTICS

COLLECTED ABSTRACT OF THE LITERATURE ON  
ROENTGENOLOGY FOR THE YEAR 1919

By I. SETH HIRSCH

DISEASES OF THE THORACIC VISCERA

*(Continued from p. 582)*

*Tuberculosis*

Wessler, in an editorial (*American Journal of Roentgenology*, p. 99) states that progress in the roentgen diagnosis of diseases of the lung, especially of tuberculosis, has been retarded by a lack of coöperation between the clinician and the roentgenologist. The reason for this is the distrust with which the clinician has regarded the labors of the roentgenologist. The fantastic diagnosis arrived at by some roentgenologists from technically poor plates is not likely to commend itself to a clinician of experience. An antiquated and inexact terminology, which has no basis in the pathology of the lung, is used in making reports of the findings. In the minds of many able medical men, an unwarranted scepticism has resulted, together with an unwillingness to grant to the roentgen examination the place in the diagnosis of pulmonary tuberculosis which its importance warrants. Norris and Landis say that the latter (the roentgenologist's) arrogate an unwarranted ability to recognize early tuberculous lesions in the lungs. In the first place, the earliest manifestations of tuberculosis, as shown on the roentgenogram, are not distinctive. In making such a statement, Norris and Landis entirely fail to take into consideration the demonstrated achievements of the roentgen-ray in the field of thoracic diagnosis.

An extension of the tuberculous process from the root to the periphery along the peribronchial tissues is a conception which in the vast majority of cases is opposed to the facts of pathology. The di-

agnosis of tuberculosis must be based on definite discrete shadows, which usually begin in the periphery of the lung and have no necessary relation to the bronchial tree.

It is an unfortunate thing, and one which has delayed the universal recognition of the roentgen-ray in chest diagnosis, that a controversy still exists as to the relative value of fluoroscopy and roentgenography. Each undoubtedly has its own field of usefulness, and both of them should form a correlative part in any complete examination. Without entering into the merits of the question at this time, there is no doubt that in the rapid examination of large numbers, fluoroscopy is important. In a rough way it may be stated that in such a rapid examination the clinician looks for râles, while the fluoroscopist seeks infiltrations. The work of the roentgenologist has wider scope, as he determines the actual presence of tuberculosis, while the physical examiner seeks evidence of its activity. It is no wonder, therefore, that he succeeds in discovering a greater number of cases of pulmonary tuberculosis, especially those cases which are latent. This has been the experience in the army camps where rapid work was essential and consequently physical examination suffered in precision. The fluoroscope reveals at a glance the existence of an infiltration, and it must remain a valuable adjunct in checking up tuberculosis in large groups of men. It is not disparaging to the clinician to affirm that a careful fluoroscopic examination sets the seal of certainty on his positive or doubtful cases, and not uncommonly leads to a revision of his negative ones.

Mantoux, C., and Maingot, G. (Roentgenoscopic Examination of the Lung and its Limited Sensitiveness, *Bulletins et Société mémoires de la médecine des hôpitaux de Paris*, Oct. 24, 1918) undertook the determination of the limitations of the fluoroscopic examination of the lungs. In the immense majority of clinical examinations of the thorax, physical signs and the data obtained by the fluoroscopic examination give similar results. Nevertheless, in some cases, the diagnosis based on these methods is not comparable; for the roentgen-ray will detect lesions deeply located and separated from the ear by a deep layer of sound pulmonary tissues, while on the contrary some lesions perceptible to the ear are invisible with roentgen-rays. Among the latter are lesions developing in bronchitis and dry pleuritis and presenting no concomitant inspissating of the pulmonary tissues; and some tuberculous infiltrating lesions invisible on



the roentgenoscopic screen because of insufficient sensitiveness of the method.

Very small lesions are undetected by roentgen-rays, as are the very fine details of bone structure. Below a certain extent and a certain thickness, the foci of tuberculous infiltration are invisible on the fluoroscopic screen.

Tests were made with normal subjects or normal stoutness, with fragments of tuberculous tissues removed at necropsies, to determine the fluoroscopic visibility of tuberculous lesions.

The following results were obtained:

(1) Fragments of tissue, from five to seven mm. thick and extending over several square centimeters, gave shadows barely visible on the screen. So also a fragment of infiltrated pleura fifteen mm. thick could not be visualized. A distinct shadow was obtained only with a fragment two cm. thick.

(2) None of these fragments gave visible shadows if examined through a stout person.

The authors conclude that the non-detection of tuberculous lesions after a roentgenoscopic examination does not prove with certainty that there are no pulmonary lesions or pleural alterations.

Heise and Sampson (*X-Ray on Pulmonary Tuberculosis*, *New York State Medical Journal*, xvii, No. 11, p. 429) describe the appearance of the early lesions of tuberculosis as follows: Within the lung-field proper there are changes which indicate that pathology exists. The first of these changes is characterized by the linear arrangement along the course of the bronchi and blood-vessels of small nodules or somewhat circular shadows. In size they may vary from 1 mm. upward. They appear to be separate and distinct, and give rise to the impression of bleeding along the ramifications. At times they appear with rather clean-cut margins, but at other times their margins, as well as the margins of the pulmonary ramifications, appear hazy and fuzzy. They may occur anywhere along the course of the blood-vessels and bronchi, which appear to be accentuated in density.

When the tubercles have become more confident, and caseous bronchopneumonia is present, an exudative type of active lesion is found. This is seen as a more or less dense shadow with irregular fuzzy outline, and in which no individual tubercles are visible. In

addition to the above changes, the fan-shaped density of Dunham is described. This area is shown by the *x*-ray as faint density surrounding the tubercles and causing their margins to appear fuzzy or hazy.

In the healing lesion, exudative inflammation disappears. The margins become more definite and the tubercle more dense, since it becomes fibrotic or calcareous. The area of caseous broncho-pneumonia loses in density, individual tubercles appear, hazy outlines are lost, and the individual tubercles undergo fibrosis or calcification, while the pulmonary ramifications in the vicinity become more definite and distinct as they become more fibrous.

The *x*-ray does afford most valuable assistance in the diagnosis of tuberculosis, for it not only informs us of the location and extent of the lesion, but to the experienced observer it also shows the character or type of the lesion much more accurately than can be ascertained by the physical signs or symptoms alone. It affords the most exact information obtainable today—unless autopsy is performed—as to the actual pathology of the condition. But it must nevertheless not be looked upon as infallible; nor must it be taken as the final word in diagnosis. It should be used rather as an aid and corroboration in diagnosis, and as a means of acquiring a better knowledge of the extent and pathology of the condition. In pulmonary tuberculosis, as in all diseases, the use of the *x*-ray for diagnosis must be based upon a good knowledge of the pathology and course of the disease.

Riviere (Hilus Tuberculosis in the Adult, *Lancet*, Feb. 8th, 1919, pp. 213-216) describes the roentgenographic appearances in hilus tuberculosis in the adult as follows:

In the chronic and quiet disease, with little or no evidence of activity, which is perhaps the commonest type of case, there is abnormal visibility of the whole lung reticulum, which appears thick and strongly shadowed in all its "twigs" right out to the periphery. The main branches appear thickened, often wide and tape-like, or may appear as rings or figures of eight, with or without some dilatation of their lumen. The whole picture has a general "fibrous appearance", nodules may be absent and yet the case may be tuberculous, or there may be a nodular appearance throughout. In many of these chronic cases the roentgenogram may present so "fibrous" a picture that it is hard to believe any activity can be present. Yet the patient

may present symptoms and develop a fresh pleurisy as evidence that the process is not obsolete.

In any form of tuberculosis, it often appears that the diseased area is roughly equal on the two sides, and often reaches nearly to the periphery. It may present a sharply marked outer margin, giving a butterfly appearance, and strongly suggesting a simultaneous spread out to this point rather than a slow creeping outward. From *x-ray* and postmortem experience, the writer is convinced that a simultaneous "sowing" of disease over a wide area occurs not infrequently, although the gradual outward spread presumed in the general description of the disease is perhaps the rule.

In the more active disease, there is a more woolly and less sharp-cut appearance of disease, which yet remains to *x-ray* examination purely "peribronchial". The thickening of the bronchi is more marked both around the root and farther out in the lung, and a nodular or even "budding" appearance may be seen. The finer network of the lung is thickened irregularly, or there are nodular shadows of various sizes, and these may have a rather dull outline.

In the active and acute disease, the strands of the lung network vanish, and the pulmonary fields become filled with woolly bronchopneumonic shadows of smaller or larger size with eventual coalescence and cavity-formation.

Saye (*Examen Radiologico de las Cavernas Tuberculosas del Pulmon*, *Archivos Espanoles de Fisiologia*, Barcelona, Jan., 1919, i, No. 1, p. 105) states that cavities may be divided into the five following divisions: (1) Cavities of the usual type, (2) giant lobar cavities, (3) cavities in formation or cavitation in the caseous stage, (4) different anomalies of cavities, (5) false cavities.

(1) Cavities of the usual types may either be very clearly defined by a thin wall with a horizontal line showing the fluid level, or they may also have distinct walls surrounded by either clear or infiltrated tissues. The cavity in the only slightly infiltrated tissues is the most frequent type, and is found in chronic fibrocaseous cases, while the cavities with sharply-defined walls and dense infiltrations are usually seen in fibrous cases and are usually multiple.

(2) Giant cavities may involve an entire lobe; in these only the inferior border can be outlined, while the other walls appear contiguous with the pleura and the mediastinum. Aimard pointed out



how easy it is to confuse the concave outline of the rib with the inferior outline of the giant cavity.

(3) Cavities in formation, giving the picture of a cavity, formed by the breaking down of lung tissue, usually consist of an area in the middle of a shadow of infiltration with a ring-shaped wall. But instead of a clear space, the inside is perfectly filled with caseous matter and detritus. These are rather harder to diagnose. Under this heading he also includes the multiple cavity formation described by Mantoux and Maingot as the "bread crumb" and "honeycomb" pictures. Another type under this division is the cavity apparently made up of a conglomeration of shadows and clearer spaces and found by autopsies to be a half-formed cavity with only a fracture of the wall formed.

(4) The most frequent form of anomaly of cavities is the cavity with the rough ring-shaped walls. This is usually situated in the parenchyma and shows very slight infiltration. Aimard has described these walls as being due to dry cavities without any signs of activity and apparently in the progress of reparation, but the author proves that, although their activity seems to be very slight, there is a distinct focus which might flare up during a very slow evolution.

(5) False cavity images, or pseudo cavities where the lung markings and vessels in perfectly healthy parenchyma may assimilate ring-shaped walls, are sometimes found.

Other facts about tuberculous cavities which have been demonstrated by means of the roentgen-ray include the greater frequency of cavities on the left side compared to the right and the demonstration of the so-called clinically latent cavities.

Sampson, Heise and Brown (A Study of Pulmonary and Pleural Annular Radiographic Shadows, together with Notes on Interlobar Fissures, *The American Review of Tuberculosis*, Jan., 1919, ii, 664) state that all annular x-ray shadows are not intrapulmonary but may be intrapleural and situated between the lobes or between the lung and the chest wall, or, in other words, that they are often inter-lobar pneumothoraces or hydropneumothoraces or the usual localized pneumothorax.

An annular or ring-like shadow, varying in shape, seen many times in normal or mildly infiltrating lung-fields, is a manifestation which leaves one in much doubt as to its diagnostic value in rela-



tion to intrapulmonary cavities. Infinitely more of the ray is absorbed inside these annular shadows than in the surrounding lung-tissue; in a small percentage of cases more ray is transmitted through this ring, while in about 60 per cent of the instances the transmission is the same. The lung markings are profuse in many of them, even when the size is extreme, occupying an entire apex or upper third.

The character of these annular or ring-like shadows varies exceedingly. At times they are like a ring of dense fibrous tissue; at other times like a circular deposit of fibrinous exudate; and lastly they may also appear fairly broad (ribbon-like) and homogenous. In many instances the lower margin is horizontal (possible fluid level). This occurs more frequently in the last two types. Seventy per cent of these shadows are above the first rib; the remainder are scattered anywhere in the lung-field. Their shape may be ovoid, triangular, more or less rectangular, or they have no definite shape.

A comparison of the physical signs, symptoms and other findings was made in 50 cases which showed these annular shadows with the clinical findings in another series of 50 cases in which the annular shadows were not present. Both series were composed of cases with definite parenchymatous lesions. The results of the comparison follow:

The onset was insidious in 48 per cent and catarrhal in 32 per cent of the cases showing annular shadows, while it was insidious in 24 per cent and catarrhal in 50 per cent of the cases not showing the shadows. Pleuritic and hemoptic onsets were of approximately the same frequency in both classes. Pleurisy with effusion occurred in only 6 per cent of these cases with annular shadows; it occurred in 14 per cent of the cases without the shadows. Dry pleurisy occurred in about equal frequency. The patients with annular shadows had at the onset an acute illness in 30 per cent of the cases; those without, in 48 per cent.

Physical signs of infiltration, or those which could be interpreted as being evidence of consolidation or cavity, occurred with the same frequency in both classes.

Râles, moderately coarse or fine, occurred in approximately the same percentage of both classes, moderately coarse râles (7-2) predominating, and the actual percentages were 100 per cent of those with annular shadows and 96 per cent of those without.

Hemoptysis occurred in a greater number of the cases which did not have the annular shadows (50 per cent) than in those in which the shadows were present (30 per cent). Streaked sputum, without hemoptysis, on the contrary, occurred more frequently (28 per cent) in those cases with annular shadows, than in those without (14 per cent).

Tubercle bacilli appeared in the sputum more or less constantly upon examination at the sanatorium, and, previous to entrance, in more cases with annular shadows (44 per cent) than in those without (18 per cent). They occurred periodically in the sputum in approximately the same percentage of cases in both groups, with (48 per cent) and without (52 per cent). However, tubercle bacilli were never found, or there was little or no expectoration in more cases without annular shadows (30 per cent) than with (8 per cent).

The cases with annular shadows showed a greater tendency to relapse, a rather serious relapse occurring in 24 per cent of those with, and in only 18 per cent of those without. Milder relapses occurred in 26 of those with and in 18 per cent of those without the shadows. Therefore, it is perhaps quite natural to expect that the condition of the patients at the time of discharge from the sanatorium would show a much greater percentage of unimproved among those patients with the annular shadows than among those without.

The authors conclude that annular shadows, surrounding areas of increased or equal absorption of the ray, indicate that patients are very likely suffering from pulmonary softening, or rupture of the lung. Owing to the presence of adhesions, only partial pneumothorax, with or without fluid, results. The site of the pneumothorax depends upon the location of the softened focus and usually occurs in the upper part of the greater oblique fissure and in the horizontal fissure on the right. These pneumothoraces can rarely be diagnosed clinically, and indicate a somewhat graver prognosis. They occurred in 11.8 per cent of 423 cases.

Evans commenting on the same subject (Significance of Annular Shadows, *The American Journal of Roentgenology*, Oct., 1919, vi, 510) states that, during the preceding years, an area of decreased density surrounded by an area of increased density has been considered a cavity.

Pneumothoraces of the larger type were recognized, which were at times clinically and roentgenologically confused with cavity for-

mation. Cases described as showing cavity formation were in reality cases of localized air pockets.

Morris Fishburg, in an article entitled "Localized Interlobar Pneumothorax" (*Archives of Internal Medicine*, Nov., 1917), covered quite fully the differential diagnosis between cavity formation and localized pneumothorax.

Localized air pockets are observed in both the peribronchial and parenchymal types of tuberculosis, the greater number being seen in peribronchial infection. The development of collections of air depends upon a superficial involvement of lung tissue, the pathology being either interlobar or occurring in the parietal portions of the lung-tissue. First, there is a pleuritis with or without fluid, and then an ulceration or rupture of the lung-tissue, so that air escapes into the area of pleuritis. The author believes that he can prophesy from certain roentgen plates where a localized pneumothorax would be likely to develop, owing to the superficiality of the lesion.

In making a differential diagnosis between cavity and localized pneumothorax, there are several aids. In the first place, the outline of the localized area of decreased density is irregular both as to contour and density, and it shades off gradually into the surrounding lung-tissue, and practically all of the normal lung structure is observed throughout the area. One can also be guided in the correct interpretation of shadows by the pathology presented in other portions of the chest. The reliable method of differentiation between the two conditions consists in obtaining serial plates. While the changes in cavity formation from week to week are relatively *nil*, the changes in the localized pneumothoraces are quite marked.

Steiner, J. M. (The Roentgen Differentiation of Cavities, Retractions and Partial Pneumothoraces, *American Journal of Roentgenology*, April, 1918) has already pointed out that in roentgenograph of the tuberculous chest, one occasionally observes large vacant areas in the normal lung fields. There are three pathological conditions which may produce such an appearance: (a) cavity, (b) retraction, and (c) partial pneumothorax.

*General Characteristic of Cavities.*—There is an absence of linear bronchial tracings. The cavities may be located at either apex or base. They rarely ever occupy the entire area from border to border and rarely extend to the extreme apex. Thick fibroid walls are usually demonstrable. When one of the walls extends to and in-



cludes the visceral pleura, there is usually a marked thickening and fibrosis of the pleura, which shows as a cloudy area in the roentgenogram. The shape is usually of a rounded or circular character, with irregularities conforming to adjacent dense tissues.

*Characteristics of Retraction.*—There are no linear bronchial tracings. The retraction is located chiefly at the apex of the lung. The shape is usually irregular, rarely of a rounded or circular character. The outline of the visceral pleura is usually clearly shown. The areas outside of the retraction are usually clear. The area in which there is an absence of lung parenchyma usually extends from the axillary border to the mediastinal border.

*Characteristics of Partial Pneumothorax.*—No linear bronchial tracings are visualized. This condition usually occurs in the bases, rarely at the apex. The outline of the lung and visceral pleura can usually be shown. The shape is always irregular. Pleural adhesions can, in many cases, be seen as bands or strings extending from the parietal pleura to the collapsed lung.

Delherm (Roentgen Findings in Tuberculosis Suspects, *Paris médicale*, Feb. 1, 1919, ix, No. 5, p. 96; from *Journal American Medical Association*, lxxii, No. 14) states that of the 1,000 men suspected of tuberculosis and sent for confirmation, 674 proved to be free from the disease. The roentgen examination often turns the scale inasmuch as the roentgenograms visualize not only the suspicious points but the whole lung. Especially important is a stereoscopic view of the same area taken with the patient erect. A deficiently illuminated apex does not indicate tuberculosis, for some people never aërate the apex fully. When the pulmonary markings are generally accentuated, usually bilateral, the presumption is in favor of ordinary bronchitis, while with such findings in tuberculosis there would be other signs in the lungs. With tumor of the lung, the subjacent lobe is clear. The outline of echinococcus cysts is usually roundish and well-defined. The author has encountered one case of syphilis of the lung; the signs of infiltration under the right clavicle and positive physical findings were not accompanied by bacilli in the sputum, and rapid improvement followed specific treatment. After pleurisy the base may show diminished illumination, the movements of the diaphragm may be hampered by adhesions, and the lung may look gray in parts. The clearing up of the lung during respiration and coughing and the absence of foci of congestion in



the subclavicular region, are instructive. In other cases, however, nothing but the continued absence of tubercle bacilli from the sputum will finally exclude tuberculosis.

Bowen, in a clinical report, points out that an unsuspected foreign body is a frequent cause of chronic bronchitis (*American Journal of Roentgenology*, March, 1919, vi, 111).

In the determination of minute bodies, small pins for instance, motion must be eliminated completely or a plate of rather pleasing quality may result which is, however, quite worthless for the purpose, inasmuch as the foreign body has not remained long enough at any one place to cast a visible shadow. This is particularly true if the body is lodged toward the lung base. The respiration must be lengthened or the exposure shortened to the point where perfect lung exposure for the entire period is assured. The exposure must be rapid.

His conclusions are:

- (1) Foreign bodies in the lung are much more frequent than is supposed.
- (2) The usual diagnosis is chronic bronchitis or slowly advancing tuberculosis.
- (3) Invisible objects may be localized by indirect means.

(To be continued)

WEINBERG, J. A.: The Influence of the Exposure to the Roentgen Ray on the Progress of Tuberculosis. *Archives of Internal Medicine*, May, 1920, xxv, No. 5, 565.

This study was undertaken for the purpose of again testing the practicability of hastening by the *x*-ray the tuberculous process in guinea-pigs inoculated for diagnostic purposes. Fifteen pigs were used, with a similar number of controls. The technic was varied as to dosage and time of administration. One exposure seemed to have no effect. Two exposures of fifteen minutes each apparently shortened the course of the disease a few days, but not enough to be of much value in the opinion of Weinberg. The blood of the rayed animals showed a notable decrease in leukocytes, particularly the lymphocytes; the histological picture of the tubercles showed a lack

of the usual round cell infiltration, while the epithelioid and large mononuclear cells were present in usual numbers. From these facts the author concludes that the latter cells are not of lymphocytic origin.

T. HOWARD.

SECTION ON  
NEUROLOGY AND PSYCHIATRY

ESKUCHEN, K.: Concerning the Problem of "*Haemorrhagia Subarachnoidalis*" (Zur Frage der "*Hæmorrhagia Subarachnoidalis*"). *Zeitschrift für die gesamte Neurologie und Psychiatrie*, 1919, xlvii, 331.

Hemorrhagia subarachnoidalis is an independent disease picture, as is also pachymeningitis hæmorrhagica. The disease arises in pre-disposed individuals (those with pathologically changed vessels, those suffering from chronic intoxication, general chronic diseases, etc.), being produced by a relatively slight external cause; or it is the result of an acute inflammatory intoxication (either local or general) or of a severe injury. The hemorrhage may be confined to a circumscribed area (circumscripts), or it may be scattered in various foci (disseminata), or it may be a general affection without any sharply defined boundaries (diffusa). As far as the course of the disease is concerned, there may be a single acute hemorrhage, repeated attacks of bleeding, or an insidious chronic hemorrhage. In the case described by the author the disease was a recurrent phenomenon accompanying and following influenza. Twice there seemed to be a diffuse subarachnoid hemorrhage which could not be localized, and the third time there was either a rather circumscribed subarachnoid hematoma in the middle section of the left anterior central convolution, which caused paralysis in the right arm and facialis, or an encephalitis in this region. A certain diagnosis can be established only on the basis of the findings of lumbar puncture. This should be undertaken as early as possible. The most effective therapy of hemorrhagia subarachnoidalis is the frequent repetition of the lumbar puncture. Where the subarachnoid bleeding is persistent, an endolumbar infusion of gelatin is indicated.

S. E. JELLIFFE.

NEU, C. F.: Treatment and Management of the Neurasthenic Individual. *Medical Record*, Feb. 28, 1920, xevii, 342.

Neu applies the term neurasthenia to an enfeeblement or primary fatigue neurosis, the chief characteristics of which are an extraordinary sense of physical or mental fatigue, or both, a difficulty in concentration, in attention and application to work, a feeling of pressure in the head and irritability of the spine, various paresthesias, and more or less functional disturbances of the various viscera, all being more or less closely related to psychogenic factors.

*Causes.*—The most commonly assigned cause is overwork, but it is usually found that insufficient time for rest and sleep and unusual activity during work have all been important factors in bringing about the final breakdown. Other causes are: great exhaustion following severe diseases, such as typhoid or influenza, suggesting a toxic condition, and non-toxic states of exhaustion such as one sees after severe hemorrhages and painful conditions associated with loss of sleep; but even here it is possible that chemical changes produce some toxic substance, which forms the basis of the subsequent neurasthenia.

Sexual irregularities such as masturbation, nocturnal emissions, coitus interruptus and excessive sexual indulgence should, according to Neu, not be rated very high as etiological factors. As a rule, it will be found that the injury resulting from these sexual indiscretions is not due to any effect upon the patient's physical condition, but to the psychic conflicts which arise in the moral and spiritual life of such an individual.

The excessive use of alcohol, coffee, narcotics, and other habit-forming drugs is also believed to be a causative factor. In this connection, however, the author urges the necessity of determining whether the excessive use is not a manifestation rather than a cause, since it is well known that the majority of neurasthenics are particularly susceptible to the action of such drugs.

Another important cause is trauma, especially where some form of litigation for compensation comes into consideration. Neurasthenia seems also to appear more readily when intense emotional disturbances are combined with unusual demands upon the physical powers of the individual.

Most frequently, in 80 per cent of the cases, however, neuras-



thenia develops upon an inherited predisposition of the nervous mechanism, which implies liability or incapacity.

*Symptoms.*—The author discusses the symptoms of the disease under seven headings: (1) cerebral, (2) spinal, (3) cardiovascular, (4) visceral, (5) urogenital, (6) traumatic and (7) general. He quotes Biborwitz, who, in classifying a large number of neurasthenics met with in a sanitarium, and consisting mostly of working people, found that 31.6 per cent came under the cerebral group, 48.3 per cent under the cerebrospinal, 6.2 per cent under the gastro-intestinal, 4.2 per cent under the cardiovascular, and 9.7 per cent under the traumatic group.

In almost all cases an unusual sense of *fatigue*, both physical and mental, is the dominating feature. This is more of a subjective sensation than an actual exhaustion, because no matter how apparently helplessly exhausted these patients may appear to be, when their attention is distracted they are often capable of prolonged effort. On account of their abnormal sense of fatigue their attention is very readily diverted, thus impairing their ability to concentrate, which results in a loss of confidence in their capabilities. This is followed by a seeming failure of memory, coupled with indecision, uncertainty, inconclusiveness, pessimism, emotional irritability, depression, loss of emotional control, doubts and phobias of various kinds, painful thoughts, impulsive and obsessional ideas.

• In all neurasthenics, during some period of their disease, sleep is more or less impaired. Many of them are unable to fall asleep, no matter how tired and sleepy they may be; they toss about restlessly in bed during the remainder of the night, or when they do go to sleep they are disturbed by terrifying dreams. As a result of this they become mentally distressed and begin to complain of numbness, constriction, emptiness, fullness, etc., of the head. In some of these patients the special senses become involved, especially vision and hearing, less frequently taste and smell.

In the *spinal* variety the patients complain of more or less aching pain, paresthesia or local tenderness over the cervicodorsal, lumbar, or coccygeal portions of the spine. Some of the patients have various paresthesia in the limbs. Tics, especially of the facial and lid muscles, are not uncommon, particularly in individuals with hysterical tendencies.

*Cardiovascular disturbances* are rarely absent, and, in some

patients, constitute the predominating feature of the disease. The pulse-rate is usually rapid and intermittent, but it may be slow. The patients complain of various disagreeable sensations over the precordial area; some may have cardiac attacks, which are anginoid in character. The physical findings are usually negative, but even when positive they are found to be out of proportion to the complaint. In the *respiratory* system, attacks of superficial breathing, dyspnea, sighing respiration, and symptoms resembling hay-fever or asthenia are not uncommon.

*Gastro-enteric* symptoms are very common; they consist in a capricious appetite, pressure in the epigastrium due to gaseous fermentation, bloating, belching, nausea, vomiting, hyperacidity, epigastric pain, pain over the regions of the gall-bladder or appendix, constipation, or attacks of diarrhea with profuse mucous stools. Many of these symptoms are partly due to secretory and motor disturbances as a result of impairment of the nervous mechanism of digestion, and partly to the peculiar anatomical make-up of the gastro-intestinal tract in such cases, for many of these patients show a marked tendency to visceroptosis.

In connection with the *genito-urinary system* one often meets with an excessive secretion of a limpid urine of low specific gravity, with an accompanying frequency of urination. Some patients suffer from hyposensitive sexual impulses, resulting in frigidity, seminal emissions, or other disturbances of sexual function. These symptoms occur more frequently in males, and form the basis of the so-called sexual neurasthenia in which the fear of the possibility of losing their manhood is a predominant feature and most difficult to treat.

*Diagnosis.*—Before the diagnosis of neurasthenia is established it is important to exclude the possibility of incipient tuberculosis, lues, arteriosclerosis and hypertension, chronic nephritis, endocrine disturbance, local infection, drug addiction, and peripheral reflex irritation, such as errors of refraction, hysteria or incipient psychoses.

*Treatment.*—The first essential in the treatment of the neurasthenic is for the physician to gain and hold the confidence of the patient. He must avoid a discussion of the patient's symptoms with others, arguments over conditions previously considered, inconsistent methods, and frequent changes in the therapeutic procedures.

In the acute condition absolute rest, both mental and physical, is

a *sine qua non*. No pains are to be spared in obtaining the proper rest and environmental conditions for these patients. In this respect no general rule, applicable to all patients, can be formulated. Although Playfair and Weir Mitchell emphasized, years ago, that the three basic principles in the treatment of neurasthenia were isolating, overfeeding, and massage, it is questionable whether isolation is advisable in all cases. In some patients solitude may become almost intolerable. Entertaining conversation, interesting light reading, either by a congenial, tactful, and sympathetic nurse, or by the patient himself, may often help to dispel distressing gloomy thoughts and drive away dreadful fears, and the tendency to melancholia.

The diet of these patients must be nutritious, easily digested, readily assimilated, and given in more or less graded quantities. Wines, liquors, strong tea, and coffee are to be avoided. Meat once a day is quite sufficient. Between the regular meals it is also advisable to give milk, either plain or modified, in various combinations with cream, rice, cocoa, or soups, up to four or five pints a day.

Massage is indicated in patients who are too weak to endure active muscular exercise. The masseur or masseuse should possess adequate muscular strength, sufficient endurance, a cheerful disposition, and a wholesome temper.

When the patient's acute condition is improving, more active measures are indicated. Graduated methodical exercises, incorporating constructive ideas and activities, always bearing the patient's likes and dislikes in mind, are to be selected. The regulated control of the patient's muscular activities tends to develop a similar control of his mental and emotional faculties, giving him encouragement, self-confidence, and hope—matters of great moment in the struggle for convalescence and recovery.

Properly selected hydrotherapeutic and electrical treatments are of inestimable value. It is well to remember that neurasthenics bear cold baths badly. It is best, therefore, to begin with warm water, gradually lowering the temperature to the point desired by the addition of cold water. The faradic bath, lasting from twenty to thirty minutes, and sufficiently strong to produce tingling but no muscular contractions, has a soothing effect on the general nervous tension. In some cases galvanic electricity applied along the course of irritable nerves lessens their exaggerated functional activity; in



other cases the high frequency and autocondensation currents are of great benefit.

Bromids are frequently indicated to diminish the nervous irritability and so-called tension which is so commonly complained of. Whether the drug is to be administered in single large doses or in divided smaller doses, or in combination with quinin or bismuth, depends upon the individual indications in each given case. Where vasomotor instability is a prominent symptom in addition to the general nervous irritability, ergot in proper doses has proven beneficial.

Strychnin is of benefit only in cases with more or less atony, and mental and muscular relaxation.

Sleeplessness is best combated by means of baths, massage, exercise, and proper nourishment. Where hypnotics are indicated, veronal, trional and sulphonal are of service. In more rebellious cases it may be necessary to resort to paraldehyd, chloral, and even morphin or codein. The latter should be used only as a last resort, because they affect many of the secretions and are liable to lead to the formation of the "drug habit."

The gastro-intestinal disturbances must be studied in each individual case and treated by general or local measures.

The question of climate, when a change of environment is necessary, is one of great importance. Generally speaking, a dry, sunny, mountain country has been found to be the most desirable, especially during the summer months. Where a change to a higher altitude is indicated, it should be made gradually, until an altitude of about 3,000 feet is reached. When the patients are on the road to recovery moderated sea baths are stimulating. Frequent voyages with well-selected companions have a wonderful effect upon the mental condition of these patients.

Psychotherapy and psychanalysis, according to Neu, can best be carried out in institutional cases, where the patients are under better control than when they are under the influence of their home environment.

Except in the cases associated with manifestations of perversion of the functions of the thyroid gland, organotherapy has not as yet given any results which offer much encouragement along these lines.

The author devotes the concluding paragraph in his paper to the consideration of prophylaxis. Children manifesting neurotic tendencies should not be constantly reminded of these inherent weaknesses.



They must be taught regularity in habits, deliberation, and regulation in all of their physical activities, and the exercise of control over their emotional life. "More careful consideration," says the author, "must be given children so endowed in preparing for their special methods of training and education."

M. KESCHNER.

FISHER, H.: Psychopathology of Eunuchoidism and its Relation to Epilepsy (Psychopathologie des Eunuchoidismus und dessen Beziehungen zur Epilepsie). *Zeitschrift für die gesamte Neurologie und Psychiatrie*, 1919, i, 11).

The author collected observations of eunuchoids during a period of four years, for the purpose of studying the obscure psychic symptoms. He selected cases in which the physical signs of this disturbance, especially the skeletal changes, were distinctly present, and arrived at the conclusion that the mental capacity of eunuchoids is within normal boundaries, and that defects of intelligence do not belong to the symptomatology of pure eunuchoidism. Consequently, wherever feeble-mindedness is met with, it may be assumed to be due to some other etiology, where there is not positive proof to the contrary. But while the natural capacities are not reduced, there is little effort toward development, with the result that the store of acquired knowledge is limited. The author describes the adult eunuchoid as being apathetic and indifferent, without lively mimic or mobility of features, without decision of character, independence, initiative, or ambition, and with little sense of those emotional values which arise on the foundation of the sexual appetites and lead to altruistic pursuits. The epileptic character, on the other hand, is to a certain degree, positive for all these traits. Common to both epilepsy and eunuchoidism, however, are the pathological signs and psychotic symptoms. Both have egocentric narrowness of mental view, clumsiness, emotional explosiveness, sensitiveness, irritability, devoutness, and a certain pedantry. In the author's opinion it may be concluded from these conditions that there is some injury or constitutional affection which may lead to the same disturbance of equilibrium of the inner secretions, with or without the preservation of the sex glands. If the sex glands are preserved, the disease is epilepsy; if

they are destroyed, it is eunuchoidism. The contrast between the active epileptic character and the negative asocial eunuchoid character is accounted for wholly by the absence of the sex glands in the eunuchoids. In all cases in which examinations of eunuchoids were made, there was pronounced hypersensitiveness to adrenalin, which was of special importance in explaining the frequently observed vasomotor symptoms. According to the author's experience, this adrenalin hypersensitiveness is common to both eunuchoids and epileptics. As the adrenalin system, from a developmental point of view, was originally a part of the sympathetic system, it is possible that after the destruction of the genital glands the sympathetic system is affected to the extent of acquiring a heightened capacity for reaction. This view is confirmed by the hypertrophy of the suprarenals after castration. The condition of the suprarenals is, also, in the author's opinion, of significance for the spasm complex. With hypertrophy of the suprarenals there is increased irritability of the muscular apparatus, and this leads to the spasm. These spasms may be conditioned centrally or peripherally. In epileptics the peripheral component seems to be significant. Experiments showed that in animals spasms could no longer be produced after the removal of the suprarenals.

S. E. JELLIFFE.

# INTERNATIONAL MEDICAL DIGEST

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# INTERNATIONAL MEDICAL DIGEST

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## SECTION ON GENERAL MEDICINE

MUNOYERRO AND CALVIN: Clinical Note about an Interesting and Exceedingly Rare Case of Hemorrhagic Septicemia (Nota previa sobre un caso interesante y extraordinariamente raro de septicemia hemorragia). *El Siglo medico*, Madrid, April 17, 1920, p. 281.

A young woman of twenty-six, family and personal histories negative, started in September, 1915 with a temperature of 42.2° C. (108° F.); she also showed swelling of the abdomen and was very pale. The urine was not examined at that time. She could take nothing but milk, as her stomach refused any other food. For five months she continued in the above condition, however, she experienced some periods of improvement. Along toward the latter part of 1916 the authors saw her first. The patient was young, small of stature and light of weight. Her nutrition was only slightly below normal, her skin pale, she was somewhat dyspneic, her tongue was coated, her pharynx and tonsils were normal, and there was no evidence of swollen glands. Her lungs were normal to percussion, but auscultation disclosed a slight weakening of sounds on the right side; there were no abnormalities in the mediastinum. The heart was normal. At first analysis the fever was 38° C. (102.2° F.). Epistaxis was noted. The first thought of the authors was to diagnose the condition as tuberculosis but an analysis of the blood established the identity of the disease.

The course of the patient's sickness follows:

*Fever.*—The fever had been constant; highest, 39° C. (102.2° F.) and lowest, 37.5° C. (99.5° F.). It was rather phenomenal that when she was fed anything else but milk, the temperature reached almost unbelievable figures, at times rising to 41° C. (105.8° F.)

*Hemorrhages.*—There was such frequent and abundant epistaxis, that it sometimes had to be fought with hypodermic injections of saline solution and horse serum. Menstruation had ceased two years previous to the author's examination. No hemorrhoids were evident, although anal hemorrhages were present. There was no hemoptysis. During the last year, she had also presented hematuria; in fact there was no micturition without blood. Albumin was found in the urine up to 6 and 7 per 1000, most of which was due to the blood.

*Respiratory Apparatus.*—As stated above, auscultation disclosed a weakening of sounds on the right side. The heart was normal and pulse, rapid and soft. The tongue was coated and the patient suffered from anorexia, nausea, vomiting and constipation. She was hysterical and presented zones of anesthesia and the laryngeal reflex lacks. She complained of insomnia and headaches and once showed a typical access to tetany.

The blood culture, the only means by which the authors could establish the true nature of the ailment, disclosed the presence of a germ in the circulatory system. The features of the germ were: It was a bacillus, of very variable dimensions, depending on the culture-medium and the moment on which the culture was taken. In one of the first cultures on agar, the organism showed an evident bipolar coloration, but this was observed only once. It was gram-negative, but on later cultures it has shown some tendency to keep the coloration. Silver impregnation showed multiple flagella. It was aerobic and grew very slowly on all media. It could stand very high temperatures; this made difficult the sterilization of its emulsions. Old cultures showed an organism with polar spores. The serum of the patient agglutinated it at a dilution of 1 in 100. The inoculation into a dove did not disclose any symptoms. Endovenous inoculation of a rabbit provoked disease. The autopsy of the animal showed collections of pus and of blood in the liver. The authors think the organism is similar to the one described under the name of *Bacterium anthroposepticum*, by Fraenkel and Pielsticker

(*Zeitschrift für Hygiene und Infectious krankheiten*, 1919, lxiv, 146). This organism was considered by these authors as one of the causal factors in some human septicemic infections of obscure origin.

Other tests carried out on the patient were Wassermann, negative; Weinberg, negative; agglutination for typhus bacillus, negative; paratyphus, A and B, and colonbacillus, negative; Malta fever, negative; the tubercle bacillus was searched for in the blood with negative results; blood count, differential count and hemoglobin, normal; Von Pirquet, negative; while the Ambard's index showed a decrease of 60 per cent in the renal activity.

The treatment used in this case follows: Hygienic measures, milk diet, and sometimes during certain periods different fruit juices were given. Other kinds of food would provoke very high temperature. Fever was fought with cold wrappings. As medicine the authors used adrenalin in injections and by mouth, and calcium when tetanic convulsions appeared. Otherwise the treatment was symptomatic. For hemorrhages saline solution and horse serum were used. Autovaccines were tried, but the results were not encouraging and the authors decided to confine themselves to the above treatment.

C. F. ARROYO.

BATEMAN, E. N., AND FAHRNEY, N. H.: A case of Septicemic Anthrax Successfully Treated by Intravenous Therapy. *Medical Journal of Australia*, Jan. 10, 1920, i, No. 2, p. 32.

The patient, a young man in the military service in Egypt, gave the history of having been shaved by a native barber. Four days later an inflamed pimple with a few surrounding vesicles developed on the right cheek. A diagnosis of anthrax was made and the pustule promptly excised. On the fourth day of the disease the tissues about the excised pustule were infiltrated and inflamed and the cervicle glands enlarged. Anthrax bacilli were found in the seropus exuding from the excised area. The general condition of the patient remained good. In spite of various measures of local treatment and the administration of 40 c. c. of Sealvo's serum subcutaneously, the general condition of the patient became progressively worse, and the local lesion continued to advance. A blood culture taken on the previous day was found positive for the anthrax bacilli, and immediately

60 c. c. of Scalvo's serum were given intravenously and 40 c. c. were given subcutaneously. This was followed by a further rise in temperature and the patient appeared to be worse. By the following day, however, the temperature had fallen below a critical point and the pulse and temperature were normal. The local inflammatory reaction now showed a marked and rapid improvement and convalescence was rapidly established.

H. WOLFER.

MOOREHEAD, T. G.: Infantilism: Pancreatic and Intestinal. *The Dublin Journal of Medical Science*, Jan., 1920, Series III, No. 577, p. 1.

Two cases of infantilism are reported. In the first the apparent pathological change was a catarrhal condition of the colon, and probably also of the small intestine. Other changes present were probably secondary and resulted from the inanition produced by the bowel condition. The author regards this as an undoubted case of intestinal infantilism.

The second case reported appears to be a further confirmation of Byron Bramwell's view that pancreatic infantilism is a definite entity.

G. A. DISTLER.

TICE, F.: Carcinoma of the Stomach. *Medical Clinics of North America*, July, 1919, iii, 25.

The interest of this case centers about these items:

(1) The patient, seventy-one years old, declared that her symptoms had been present only three months, when she noticed epigastric pain which was aggravated by eating solid food, but which was temporarily relieved by fluids. The other usual symptoms succeeded. She died shortly after entering the hospital.

(2) A large, irregular, hard mass was palpable.

(3) Blood and the absence of free HCl were demonstrated in the stomach contents, and visible peristalsis was brought out by in-



flating the stomach; but vomiting and increased pain also resulted.

(4) Defective filling was demonstrated by the *x*-ray.

(5) Autopsy revealed an enormous ulcerating mass involving stomach, liver and omentum. Two metal wires about four inches long and as large as ordinary knitting needles were found, one penetrating from the stomach into the mass, the other embedded near by in the omentum. They did not show in the roentgenographs, and no history as to their origin was elicited.

H. G. WEBSTER.

TICE, F.: Mediastinal Tumor. *Medical Clinics of North America*, July, 1919, iii, 19.

The patient, a woman thirty-one years old, showed cough, dyspnea and dysphagia; she grew progressively worse over a period of about three months. Physical examination showed that a mediastinal tumor was crowding the upper portions of the lungs apart and was pushing the heart downward to the left. There were numerous glandular metastases, especially at the right clavicle, but the patient refused to permit any to be removed for diagnosis. The *x*-ray examination revealed a large non-expansile mediastinal mass. All clinical laboratory findings were negative. Autopsy showed a large lymphosarcoma with growth within the pericardium and right auricle. Dr. Tice discusses the differential diagnosis of Hodgkin's disease, aneurysm, and malignant growth.

H. G. WEBSTER.

CADE, A., AND PARTURIER, G.: Medical Treatment of Duodenal Ulcer. *Lyon médical*, Apr. 25, 1920, cxxix, No. 8, pp. 372-373.

The authors consider under this heading:

- (1) Medical treatment itself.
- (2) Medical treatment as an aid to surgery.

A. *Medical Duodenal Ulcers:*

- (1) For the pain and the symptoms resulting from pylorospasm,

the authors use belladonna or atropin. These drugs are much more efficacious than are opiates. A mixture of belladonna, opium and antipyrin is very effective when administered rectally. Subcutaneously, morphin and atropin give good results.

(2) In the intervals, the treatment should be directed against the associated hyperchlorhydria and dyspepsia, and against hemorrhage, when it is present.

(a) For the hyperchlorhydria, the authors use:

Sodium bicarbonate.

Creta preparata.

Calcined magnesium.

One dram of this mixture is given before and after meals.

(b) For the dyspepsia, digestive ferments are given—chiefly pancreatin.

(c) For latent hemorrhage, the authors advise blood serum.

In all cases, the diet should be regulated carefully. At the time of hemorrhage or of severe crises of pain, milk should be the chief article of food. In the intervals, the diet should be similar to that used in gastric ulcer, but it need not be so rigorously adhered to.

#### B. *Surgical Duodenal Ulcers:*

(1) Perforation.

(2) Hemorrhage.

(3) Repeated and increasing pain.

For some time before operating, the authors attempted to build up the patient by a vegetable diet; they use also sodium glycerophosphate. Cardiac tonics—e. g. spartein and camphor—are given if necessary. Pain and hemorrhage are treated as in medical cases.

Immediately preceding the operation, all food is withheld. Water is allowed in small quantities. A saline infusion is given about 24 hours before the operation. Three hours after this an enema is given.

After operation, the food should consist of vegetables, in very small amounts, for the first week. After that time, a mixed diet may be allowed.

Constipation should be overcome by the food allowed—legumes, honey, prunes. Oil in tablespoonful doses, morning and evening, is very effective. Glycerin and soap-suds enemas also are useful.

S. KAHN.

LECLERCQ, A.: Therapeutic Applications of Phloridzin. *Paris médical*, Sept. 27, 1919, ix, No. 39, p. 248.

Leclercq treated 6 patients suffering from cardiorenal disease, arteriosclerosis, hypertension and the associated phenomena, with daily subcutaneous injections of phloridzin—in dosages varying from 0.005 grain (0.0003 gram) to 0.05 grain (0.00324 gram)—for from four to five days. A marked diuresis results, which lasts for several days after the last injection. Dyspnea is decreased, and refreshing sleep ensues. The albuminuria gradually lessens. The glycosuria resulting from the phloridzin persists for several hours only.

Leclercq obtained these results by modifying the patients' diet. Phloridzin acts, apparently, by stimulating the elimination of the toxic end-products of metabolism, by some complex process.

S. KAHN.

BASTEDO, W. A.: Points in the Pharmacology of Certain Drugs used for Stomach Effects. *The American Journal of the Medical Sciences*, Jan., 1920, clix, Part 1, No. 574, p. 53.

*Atropin*.—A study of the application of atropin to the acidity and secretion of the stomach shows that in ordinary cases of hyperacidity with cessation of secretion, atropin, or belladonna, in maximum doses, given either by mouth or hypodermically, has no useful effect on acidity or secretion. In continuous secretion cases a maximum dose given hypodermically half an hour before the meal did not lessen the acidity or the secretion, but it did check the secretion after the digestive period. Another maximum dose at the end of the digestive period stopped the secretion in one hour. It fails to affect hyperacidity. The natural secretion of mucus is not affected, but the psychic secretion is lessened. Atropin in maximum doses does affect motor function by abolishing the abnormal spasmodic condition—pylorospasm.

*Pepsin*.—This should be used in subacidity and achylia with a sufficient quantity of hydrochloric acid.

*Rennin*.—If rennin is added to milk immediately before it is swallowed, in cases of achylia with diarrhea it will coagulate the milk and prevent a rapid passage into the intestines. If it is used

in hyperacidity cases, it will forestall the undesired acid coagulation.

*Hydrochloric Acid.*—If this is given in cases of achylia gastrica, which is usually associated with rapid emptying of the stomach and subsequent diarrhea, it usually overcomes the condition, but it should always be accompanied by pepsin. If acid produces soreness and irritation, it should be discontinued. To avoid acidosis, alkalis should be given during the same period, although not at the same time; the amount required should be judged by the effect of the urine reaction. Hydrochloric acid diluted (20 to 30 minims) with a few grains of pepsin in a glass of water should be taken with the protein during the meal, or half an hour or one hour later. Liquid preparations give better results than the solid hydrochloric compounds.

*Bitters.*—If these are used in small doses, five or ten minutes before eating, they promote gastric secretion and are useful as appetizers. They should be used only when the appetite is not already normal, because in normal conditions they derange the secretion and induce nausea. It is best to give them in liquid form.

*Cerium.*—Large doses of cerium are useful. The action is mechanical, as a protective to local gastric mucous membrane irritation. It is useless when vomiting is caused by central irritation.

*Bismuth Salts.*—The subcarbonate and subnitrate act as a protective by coating the mucous membrane and are not antacid.

*Silver Nitrate.*—Bastedo recalls two cases of argyria. One following the administration of  $\frac{1}{4}$  grain doses of silver nitrate for two months three times a day. Another resulted from the application of caustic stick, one a day over a long period.

A. T. MAYS.

PERCY, N. M.: Whole Blood Transfusions. *Northwest Medicine*, April-May, 1920, xix, 87 and 119.

According to Percy, transfusion of blood is the most efficient measure at our command for treating hemorrhage, and, in fact, most of the diseases of the blood, as well as many wasting diseases. The proper selection of donors by means of adequate preliminary examinations is of utmost importance. Amounts from 500 to 800 c.c. of the whole blood, repeated at intervals of from seven to fifteen



days, are most desirable. A simple, rapid method of transfusion should be used. This should preferably be one in which plain whole blood is administered without mixing with any foreign substance; furthermore, the blood should not be unduly exposed to the air, and the interval during which it is out of the circulation should be reduced to a minimum. An indirect closed method by means of a prepared container seems to answer these requirements best.

M. KESCHNER.

KAUFMAN, B.: The Relation of Malaria to Pregnancy. *New York Medical Journal*, Dec. 20, 1919, ex, 1028.

According to Kaufman the presence of malaria during pregnancy, either early or late, need cause no great alarm so long as its presence is recognized and steps are taken to combat it, but if it is allowed to remain untreated, it will sooner or later lead to abortion or miscarriage. Pregnancy seems to reactivate a latent or chronic malaria; this is borne out by the utter disregard of the seasonal incidence with which acute symptoms of malarial infection develop in pregnancy.

In spite of the widespread idea that quinin is an abortifacient, it is necessary to administer the drug in suitable doses as soon as the condition is recognized, and this, no matter whether the patient has just become *enciente* or is already far advanced in pregnancy. Unless quinin is given in sufficiently large doses to overcome the infection quickly, abortion or miscarriage will occur. The author insists upon the necessity of giving a prophylactic dose of quinin throughout the entire period of pregnancy in the case of women who have either had a recurrence or been reinfected with malaria.

Kaufman calls attention to the fact that during these attacks the urine shows marked albuminuria, which is not to be mistaken for true renal albuminuria, because the albumin found is the result solely of the concomitant malarial infection and disappears rapidly after the malaria has abated. That this albuminuria does not favor the development of eclampsia is borne out by the author's experience with 250 obstetrical cases in a badly infected region; among these there was not a single case of eclampsia. What the ultimate outcome in this respect would be if the patients were not promptly and intensively treated with quinin, he does not venture to state.

He has met some patients who could not tolerate quinin by mouth; they developed intense urticaria, edema of the face, hands, and feet, a sense of choking, weakness, and even syncope, following the administration of the minutest dose of the drug. In these cases the preliminary administration of bromids usually lessened but did not entirely eliminate the untoward effects of the quinin. He finally resorted to intramuscular injections of sterile solutions of quinin and urea, beginning with 1 c.c. of a one per cent solution. This was well borne and in this way he succeeded in establishing immunity to the ill-effects of the drug.

While the end result of such a complicating infection may be dangerous to the mother, as far as labor is concerned, the author has never seen any ill-effects in the child. Judging from the size and lustiness at birth of these children, they are apparently not injured in their intra-uterine growth. He saw one case in which twins were born to a mother who had had an intercurrent malarial infection; one of the children was born dead and one alive, but curiously enough, this had also been the case in a previous pregnancy during which she had been free from malaria.

In patients treated or untreated during pregnancy, it is almost uniformly certain that in spite of rigid asepsis during labor and postpartum, sooner or later a rise in temperature develops. This may occur at any time from the third to the eighth day. Sufficiently large doses of quinin produce a prompt reduction of temperature and result in a normal puerperium. He does not know what the cause of this phenomenon may be, but the result of giving quinin is uniformly so satisfactory that he has made it a rule to give this drug immediately after delivery and to continue it for about ten days. The tendency to delayed involution and postpartum hemorrhage in these patients is another good reason for the continuous administration of quinin.

Kaufman is sure that the presence of a malarial infection results in a lessened tendency for postpartum perineal tears to heal; the prophylactic indications in this respect are self-evident.

The diagnostic value of quinin in these cases must not be overlooked. Five days' treatment with sufficient doses of the drug, with no improvement in the patient's condition after labor, is sufficient evidence to definitely exclude malaria as an etiological factor of postpartum fever, and the presence of septicemia or infection from re-

tained secundines must be considered. The routine use of quinin is also of value in protecting the milk supply for the infant. Breast milk from a mother who has more or less fever is not proper nourishment for an infant, and although quinin is excreted by milk no harm will come to the child and much good will be done by conserving the milk supply in its natural state. The average woman of to-day, being well informed of the significance of fever after childbirth, becomes very anxious when a rise in temperature occurs at this time; she takes it for granted that all fevers during the puerperium are due to sepsis. To protect the patient from this anxiety and to maintain her normal psychic equilibrium, when fever occurs, is also, in the opinion of the author, a clear therapeutic indication.

M. KESCHNER.

HERZHEIMER: Acute Yellow Atrophy of the Liver, Syphilis and Salvarsan (Ueber akute gelbe Leberatrophie, Syphilis und Salvarsan). *Berliner klinische Wochenschrift*, April 19, 1920, No. 16, p. 359.

Seven cases have come to the author's notice. He could find only 70 other reported in the literature. In 6 of his patients, syphilis was directly responsible for the atrophy. All of these occurred in men, the statistics being taken from the army. Most of those studied were subacute and there was some evidence of liver regeneration. The liver was small and red in color; there was disintegration of the hepatic cells, except in certain peripheral areas where hyperplasia and hypertrophy existed. The left lobe of the organ was more involved than the right. On specific atrophy the cells about the center of the lobule are most severely attacked. A like attack occurs in chloroform poisoning. In the atrophy due to phosphorus and arsenic, the periphery of the lobule suffers most.

The author divides syphilitic icterus into two types: (1) Benign, or *icterus syphiliticus precox*; this ends in recovery; (2) *icterus gravis*, or the type which ends in acute yellow atrophy. The first type occurs about the time the syphilitic exanthem appears and is probably due to an enlarged luetic gland in the portal fissure compressing the bile-ducts. It may also be the result of a catarrhal cholangitis. The second type occurs a few weeks after the specific initial lesion and

is rapidly fatal under the picture of yellow atrophy. Both mercury and salvarsan have been held responsible for this. The author excludes the action of salvarsan in the production of this pathological picture for the following reasons: Histologically, the periphery of the lobule does not bear the brunt of the pathology such as occurs in arsenical poisoning. Atrophy is also a rarity under intensive salvarsan treatment of intertiary lues. There are no other evidences of the toxic effects of salvarsan (encephalitis hemorrhagica). Often in syphilitic jaundice salvarsan is of distinct benefit.

Large amounts of salvarsan have been found in livers at post-mortem examinations, without any evidences of atrophy. Occasionally a benign icterus follows the administration of salvarsan. This is a result of an arsenical gastroduodenitis with an ascending cholangitis.

The author concludes that syphilis may be an etiological factor in the production of liver atrophy, that it is a result of secondary lues, and that salvarsan has no bearing upon its production.

II. JOACHIM.

ALLEN, F. M., AND MITCHELL, J. W.: A Case of Hereditary Diabetes. *Archives of Internal Medicine*, June, 1920, xxv, No. 6, p. 648.

This paper is summarized by the authors as follows:

One of the patients of the diabetic service at the U. S. Army General Hospital, Number 9, at Lakewood, N. J., came of a family in which seven out of fourteen children of one father (one by one woman, thirteen by another) were diabetic. In addition to the treatment, clinical and pathological studies were carried out in the attempt to throw lights on the hereditary feature of the condition. The patient when received was in the later stages of diabetes and tuberculosis, with dangerous acidosis, emaciation and weakness. In consequence of a week of fasting and a month of extreme undernutrition, he became able to tolerate diets between 1,500 and 2,000 calories, without glycosuria or acidosis, showed improvement in strength and lung symptoms, and lived six months. This result in a case of this severity adds to the evidence that the combination of diabetes and tuberculosis is best treated by a diet which controls the diabetes.



Clinical examination of the patient and his family for general or focal infections, including clinical and serological examinations for syphilis, were negative. Glucose tolerance tests afforded an early diagnosis of one of the seven cases, but was negative in the mother and remaining children.

The gross and microscopic pathologic findings served further to exclude syphilis, and were characteristic of tuberculosis. The pancreas showed changes of two types, namely, occasional hydropic degeneration of islands, which is the result of overstrain, and slight fibrosis and hyalin formation in islands, which may indicate infectious or toxic damage as the cause of the diabetes.

In general, the diabetic heredity, which apparently came through the father, was manifest in the children who most resembled him in coloring of complexion, eyes and hair; but the rule was not absolute. As far as glucose tolerance tests could decide, the diabetic tendency was inherited as a unit character, and the tolerance of the remaining children was apparently normal; but this evidence is not decisive, partly because of the limitations of this test in revealing pancreatic deficiency, and partly because the tendency might consist in a susceptibility to infectious or toxic injury, which might yet appear in the other children if the proper organism gained access. This case conforms to the general rule that signs of infectious or toxic damage are found similarly in hereditary and other cases of diabetes. The reason for the peculiar liability to diabetogenic injuries to the pancreas in certain families is undertermined.

T. HOWARD.

MARIE, P., CROUZON, AND BOUTTIERS: Boron Salts in the Treatment of Epilepsy. Proceedings of the *Académie de médecine de Paris*, June 1, 1920; reviewed in *La Presse médical*, June 5, 1920, xxviii, No. 37, p. 367.

The authors have used the salts of boron in the treatment of epilepsy, and have found them as efficacious as the bromids in reducing the number and intensity of the epileptic seizures.

The salt particularly recommended is boron-potassium-tartrate. Three grains are to be taken daily, in an aqueous solution.

The diminution in the frequency and severity of the attacks be-

comes marked about a week after treatment is begun, and the time between attacks gradually progresses.

The use of this drug results in none of the unfavorable complications occasionally seen when bromids are used. There is no mental depression, no acne, no gastro-intestinal disturbance. Patients do not object to a prolonged use of the boron salt.

The mode of action of bromids differs greatly from that of the boron-potassium-tartrate. The former act by decreasing the reactivity of the nerve centers. This results in the weakening or abolishing of reflexes—tendinous, musculo-cutaneous, and even pupillary. The boron salt produces no effect of this kind.

S. KAHN.

CUMMINGS, J. G.: The Epidemiology of Influenza-pneumonia. *The Journal of Laboratory and Clinical Medicine*, March, 1920, v, No. 6, p. 364.

As a result of the influenza epidemic, the pneumonia death-rate in civil life was 4.7 per 1,000, while in the army the rate was 14.4 per 1000. What is the reason for this difference? The young adult is more subject to exposure, owing to his mode of life. Fundamentally, infection results only from the introduction of the specific organism. Exposure is the prime factor, the secondary, being the susceptibility of the individual. This depends largely on the immunity conferred by a previous attack. On this hypothesis we would expect the highest influenza rate in children and the lowest among the aged. An investigation of the rates in public institutions confirms this theory. Epidemiologic studies show very definitely that air space, within moderate limits, adequacy of clothes, habits, fatigue, the kind and adequacy of food and water, play little or no part in the spread of the so-called respiratory disease.

This leaves only insanitary messing and other indirect contact, and our recent laboratory studies and field investigations of troops show that in them the respiratory diseases are spread by indirect rather than by direct contact. Droplet infection in camps, in civil life, and in hospitals is believed to play a minor part in the spread of sputum-borne disease.

The author concluded that the results of epidemiologic studies

and laboratory research show that indirect spread through the hand or through the hand, auxiliary to the mouth, is by far the most important and major route of contagion dissemination. Granting that this is true, preventive measures will not consist of periodic masking of the populace, but simply an intensification of the rules of personal hygiene, especially the sanitation of eating utensils, and the protection of food. The most ordinary social requirements demand clean hands, clean eating utensils, and the protection of food supplies. But we must extend this to mean the actual sterilization of eating utensils both in the army and in civilian life. In both, boiling water is essential for sanitary dish water. In civil life this should be provided in restaurants and public food dispensaries by washing machines. In the army, if mess kits are utilized, the washing water must be boiling for two reasons; viz., to sterilize the mess gear and to prevent soldiers from putting their hands into it, thereby contaminating the water or their hands, as the case may be.

C. M. ANDERSON.

O'HARE, J. P.: Vascular Reactions in Vascular Hypertension. *The American Journal of the Medical Sciences*, March, 1920, clix, Part 3, No. 576, p. 369.

*Effect of Quiet and Rest.*—A definite and marked fall in both systolic and diastolic pressure followed quiet and rest. The time necessary to establish such a fall varied in commensuration with the degree of the fall, both being dependent upon the nervous tension of the patient, and upon the patient becoming accustomed to the procedure. The systolic pressure ranged from 0 to 46 mm. with an average of 21 mm. fall. The diastolic fall varied from 0 to 18 mm., averaging 10 mm.

*Effect of Excitement.*—A sharp rise was noted, averaging 30 mm. systolic, and 12 mm. diastolic. As a stimulus for excitement, the patient was urged to talk about disturbing subjects, such as operations, deaths, examinations, etc.

*Effect of Exercise.*—Here results conflicted. Generally both systolic and diastolic pressure rose. The usual curve was sharp and was followed by a fall almost as sharp. The results were similar to those which occurred in normal individuals. In the hypertension

patients a moderate effort showed a sudden change in the pressures. A rise of 57 mm. in a normal person is of much less significance than it is in a patient who already has a high pressure. Of little significance are even moderate changes noted from time to time unless they are all in the same direction.

• *Effect of Nitroglycerin.*—Sixteen cases of hypertension were studied. A dose of 0.0006 to 0.0009 gram was put beneath the tongue. Instead of finding a sharp fall a primary rise of about 20 mm. was noted in the majority of patients and this occurred during the height of the symptomatic reaction, flushing, pounding in the head, pounding over the precordium. The drop in pressure was comparatively slight and when there was considerable fall, it required a very long time to reach this depth. O'Hare believes that the fall should be attributed to the rest and quiet which was more effective than the dose of nitroglycerin.

In spite of this finding, nitroglycerin causes a vasodilatation of various blood vessels, as clinical experience has taught its value in angina pectoris.

*Effect of Adrenalin.*—The effect was studied in 10 cases of hypertension. One-half c. c. of a 1 to 1000 was injected deep into the deltoid muscle. The reaction was striking. In two cases the rise was alarming, over 80 mm. in two minutes. This pressure was not maintained for more than a few minutes. Occasionally there was a second slight rise during the progress of the fall. An elderly woman with a blood-pressure of 200 who had had several attacks of angina became very pale and frightened and had the worst attack of angina she had ever experienced when the pressure rose to 270 mm. A few of the curves resembled Goetsch's in hyperthyroid cases, especially those with the secondary rise, but the patients here studied were not hyperthyroid cases.

A. T. MAYS.

EDGEcombe, W.: Modern Conceptions of Heart Disease. *The Practitioner*, March, 1920, civ, No.621, p. 197.

In the old conception of valvular disease, infection was recognized as the initial cause of valvular defect but the after results were explained mainly on mechanical grounds as being due to the inter-



ference with the normal course of blood through the heart leading to dilatation, hypertrophy, back pressure, general venous engorgement, and heart-failure, because the heart muscle finally yielded to the long-continued extra work it was called upon to perform. The modern conception regards infection or poisoning of the heart muscle as the primary factor.

Hypertrophy and dilatation indicate the extent of damage to the cardiac muscle. If a valve is attacked but the muscle escapes, in healing the scar may contract with puckering of the edges. Mitral regurgitation follows. The muscle being intact, the reserve power of the heart is sufficient to maintain the circulation through a long strenuous life. The mere regurgitation of blood will not give rise to dilatation, hypertrophy and so-called back pressure.

The following facts support this view:

(1) Aseptic experimental production of a valve-lesion causing regurgitation is not necessarily followed by enlargement or by any change in the muscle.

(2) Cases of frank valvular disease may be found postmortem to show no change in the muscle.

(3) The largest hearts postmortem frequently show no valve lesion but are associated with syphilis, renal disease, emphysema, adherent pericardium and alcoholism.

Mitral stenosis and regurgitation are merely degrees of the same process and should be spoken of by the term "mitral disease." The early diagnosis of mitral disease is a matter of great difficulty. An apical systolic murmur does not necessarily indicate it, but if with the murmur there is a history of rheumatism and a definite enlargement of the heart, the probability is strengthened. The cardio-respiratory murmur, that of a relaxed mitral ring and exo-cardial murmurs are confusing and often cannot be distinguished from that due to a damaged mitral valve. The loudness, character, and conduction of the murmurs are not necessarily of help in distinguishing between them. At least three years are required after the original infection before mitral stenosis begins to develop and at least five before it becomes fully developed. The presence of a systolic bruit at the apex is no proof that mitral disease exists but the presence of presystolic murmur is definite evidence that the valve is affected and mitral stenosis means an infection not only of the valve but of

the heart muscle also. It follows then that every case of recent infection showing a systolic bruit at the apex must be watched for a period of years at least, before it can be safely stated that the mitral valve is not seriously affected.

The same principles apply to aortic disease, but the risk of damage to the heart muscle is accentuated by the proximity of the coronary arteries, for if they become involved the nutrition of the heart suffers and inflammatory or degenerative changes are accelerated. Hence there is greater seriousness connected, on the whole, with aortic disease than with mitral disease.

All gradations of infections are met with in heart disease. The idea that the heart may be subject to low forms of chronic infection other than rheumatic, although not new, has assumed greater prominence. Organisms of various kinds have been found in the heart muscle; the difficulty is to diagnose their presence during life. Damage by chemical poisons, such as alcohol and tobacco, or by toxins, e. g., diphtheria, is well recognized, but it is often impossible to differentiate clinically between them and infection.

The practical point is that all cases of infection should be carefully watched with respect to heart trouble; that the period of convalescence from acute infective disease should be lengthened beyond that usually thought necessary; and that all cases of apparently unimportant heart lesions should be carefully guarded against infection.

Prognosis in valvular disease has changed materially. We now recognize that the functional capacity is of more importance than structural defects. If the exercise-reaction and the tolerance of sustained exercise are good and there is no enlargement, the muscle is probably undamaged and murmurs may be neglected. If a diastolic murmur is present either at the aortic or mitral area, there is evidence of structural organic disease; but if the exercise-reaction and tolerance are good and there is no enlargement, a good prognosis may be given, but the case must be watched for evidence of muscle damage or slow chronic infection.

Perhaps the most striking change in the outlook on cardiac affections is our increased knowledge of abnormalities of rhythm. The chief forms follow:

(1) *Sinus Irregularity in the Young*.—The stimulation begins at the normal place and proceeds normally but occurs at irregular

intervals and is probably a vagus effect. It is typified by respiratory arrhythmia and is presumptive evidence of healthy heart muscle from the fact that response is so ready to vagus variations.

(2) *Sino-auricular Block (Relatively Uncommon)*.—The stimulus arises at the sino-auricular node and proceeds normally but sometimes fails to start, resulting in a pause during which the whole heart is at rest. The polygraph or electrocardiogram is necessary for its discovery.

(3) *Extra Systoles (Very Common and Usually of Little Moment)*.—Here the stimuli may arise in an ectopic irritable focus anywhere in the heart. They may be recognized by auscultation and palpation, but instrumental aid is required to determine the site of origin. Usually they are most in evidence when the pulse-rate is slow and tend to disappear when the heart quickens through exercise or emotion. If they appear only after exertion, they may indicate some mechanical interference with contraction; they are then more serious.

(4) *Paroxysmal Tachycardia*.—The stimulus arises in an ectopic focus in the wall of the auricle and the whole heart beats in an orderly sequence at a greatly accelerated rate. It is characterized by a sudden onset and equally sudden cessation.

(5) *Auricular Flutter (Exaggerated Paroxysmal Tachycardia)*.—The line is drawn at 200 beats per minute. Beyond the rate of 240-250 the ventricle fails to respond to the contractions of the auricle and a heart-block, usually 2-1 appears. Clinically it can be recognized if watched carefully. It occurs mainly in middle or late life, appears intermittently at first, but tends to become established. Vigorous dosing with digitalis may convert it into auricular fibrillation.

(6) *Auricular Fibrillation*.—The pulse is wholly irregular, no two successive beats being alike in time and force. The contraction of the auricle is replaced by tremulous flickerings of individual fibers or bundles of fibers in response to minute ectopic stimuli. The ventricle responds irregularly to such stimuli as are strong enough to get through. It is usually recognized easily by clinical methods. It may occur intermittently at first, but once established it endures for life. In the terminal stage of heart-failure, the end may be due to ventricular fibrillation without necessarily a preceding auricular fibrillation.

(7) *Heart-block*.—The stimulus from the auricle fails to reach

the ventricle due to a block in the conducting paths. It may be recognized clinically. If dissociation is complete, the ventricle beats at a rate of 30-40 while the auricle contracts at the normal rate.

(8) *Pulsus Alternans*.—Regularly alternating strong and weak beats regularly spaced in time, are noticeable. It can seldom be determined by touch alone but may sometimes be heard in taking blood-pressure. It is supposed to indicate a falling myocardium and will often indicate impending danger when other signs may not suggest it.

P. L. DuBois.

Dozzi, L.: Angina Pectoris. Etiological Diagnosis and Prognosis. *Gazzetta degli ospedali e delle cliniche*, Jan. 1, 1920, xli, No. 1, p. 5.

The old differentiation between true and false angina pectoris may at times be misleading and, therefore, dangerous when used in establishing a prognosis. The element of the examination consists in conducting a thorough investigation as to its etiology.

Lian (*Journal de médecine et de chirurgie pratique*, July, 1919) asserts that etiologically the following types and facts must be considered:

(1) *Angina due to Chronic Aortitis with or without Coronary Insufficiency, Angina due to Arterial Hypertension, or Angina due to Nephritis*.—This form is the most grave, frequent, and typical of all. When it is of renal origin, it may come on at night, accompanied by an attack of pseudo-asthma. The prognosis is grave, as death may supervene instantly. Its graveness may be attenuated, if the treatment has a favorable influence. It is important to note that in this type it is possible to have pectoral pain of a dyspeptic or hysterical nature, independent of the organic lesion. The prognosis here should be also guarded, for the circulatory disturbance induced, along with the coexisting pathology, may prove very serious. Syphilis must be excluded, as angina pectoris is one of its frequent consequences.

(2) *Angina Depending upon Other Cardiovascular Pathology*.—This form is rarer than the former, but it is just as grave; it is fre-



quently found in lesions of the aortic valves. Of the acute forms, aortitis and pericarditis are most liable to cause anginal attacks. The physical findings render the diagnosis easy. Frequently there is phrenic neuralgia, which is detected by pressure. Extrasystolic arrhythmia and paroxysmal tachycardia may be complications, in which case the prognosis depends upon the fundamental affection. Angina, occurring during violent cardiac exertion, is critical only during the attack.

(3) *Gastro-intestinal Tract and Appendages*.—This form is frequent in dyspeptics, especially if it is accompanied by aërophagia and when a neuropathic state exists. Attacks may occur from two to four hours after meals, and, therefore, they are not unusual during the night. They are preceded by eructations, followed by epigastric discomfort. A true organic lesion may coëxist, and care should be exercised not to be misled by the gastric symptoms, for it has a decided bearing on the prognosis. Intestinal colic, with violent epigastric pain, gradually relieved by liquid bowel evacuations, must be excluded. Hepatic and renal colic with atypical symptoms may complicate and simulate true angina, and must not be overlooked.

(4) *Angina of Nervous Origin*.—This form may complicate other nervous diseases, especially neuralgia and neuritis of the left arm, phrenic or intercostal neuralgia, the angina of tabes, and certain manifestations found in hysterical and neuropathic neurasthenics. In these cases of nervous angina, the diagnosis is based on the absence of any organic affection which is capable of causing the same. The prognosis, when uncomplicated, is favorable.

(5) *Nicotin Angina*.—There is nothing definite about this type. The clinical aspects vary. The early attacks frequently occur during the night. Fatal cases are rare. Prohibiting the use of tobacco cures the affection and clears the diagnosis.

J. R. VALINOTI.

PFALZ, W.: The Treatment of Cardiac Disease with Infusions of Glucose. *Deutsche medizinische Wochenschrift*, Oct. 23, 1919, xlv, No. 43, p. 1181.

The author's interest in this subject was stimulated by the work of Büdingen. The latter believes that glucose constitutes one of the

most important sources of energy for the proper activity of the cardiac muscle. According to Ivar Bang the blood must contain from 0.07 to 0.11 per cent of glucose in order to enable the heart to perform its action normally. Inasmuch as sudden transitions from the slightest to the highest demands on cardiac activity frequently occur, some reserve material must exist as a source of energy upon which the heart may draw when the occasion for excessive energy arises. The most important reserve material in the carbon metabolism is glycogen, rather large quantities of which have long been known to exist in heart-muscle. According to Büdingen there are many cases, however, in which the glycogen content of the myocardium is not sufficient, due to the fact that there is not enough glucose in the system to allow of the storing up of reserve glycogen. In other words, a condition of insufficient nutrition of the myocardium arises. This is called *cardiodystrophy*.

Büdingen divides the *cardiodystrophies* into two groups:

(1) *Cardiogenous, or Endogenous Cardiodystrophies*.—The cause of these lies within the heart itself. An example of this variety is coronary sclerosis, in which, on account of functional or organic contraction of the coronary arteries, the circulation is very poor, resulting in a diminution of the quantity of blood-glucose carried to the heart-muscle. Other examples are found in cases in which, due to the continuous overactivity of the entire myocardium or parts thereof, the normal supply of blood-sugar does not seem to be sufficient for the proper nutrition of the heart. That is, a relative hypoglycemia is observed in cases of hypertension with cardiac hypertrophy and dilatation, in myocardial degeneration with cardiac dilatation, and in valvular lesions with increasing stenosis of any of the orifices.

(2) *Ectocardiogenous or Ectogenous Cardiodystrophies*.—The cause of these lies outside of the heart but affects the heart itself. Of special importance, according to Büdingen, is the absolute diminution in the amount of blood-sugar (absolute hypoglycemia). The effects of this on the heart are evidenced by sensations of pressure in the cardiac region, diminution in the general bodily activity, and poor heart-sounds. Hypothetical causes are disturbances in sugar metabolism within the myocardium, such as are met with in diseases of the glands of internal secretion, in infectious diseases, in intoxications and in processes of senility.

The cardiodystrophies enumerated above are indications for treatment with infusions of blood-sugar, which by the sudden flooding of the venous blood with glucose, stimulate the nutritive processes of the heart, thereby increasing the blood-sugar index.

Pfalz has employed this therapeutic procedure in a series of cases by means of the following technic: He employs a 12 to 20 per cent glucose solution, which he makes from chemically pure Merck's glucose tablets, which have been previously sterilized. He finds, on the average, that six or seven infusions of from 200 to 300 c.c. each, once a week, are sufficient. The solution must have the temperature of the body. He employs the infusion apparatus of Dr. Schreiber, which consists in a crystal glass syringe, a T-shaped canula, and a graduated cylindrical measure with a tube.

Among the cases which he treated in this way were 2 of coronary sclerosis and angina pectoris without hypertension in which, at the end of the treatment, the sense of oppression in the chest, and the radiating pains in the left arm after exertion, had completely disappeared. In 3 cases of general arteriosclerosis with hypertension and angina pectoris, and in 1 case of peripheral arteriosclerosis and syphilitic aortitis with severe attacks of angina pectoris, the infusions were beneficial; the oppression and pains within the chest, and the dyspnea, gradually ceased and the general condition of the patients improved. In 1 case of myocardial degeneration with absolute irregularity on account of auricular fibrillation and cardiac insufficiency, there was a considerable improvement in the subjective symptoms and in the manifestation of cardiac insufficiency, so that the patient could undertake work requiring moderate exertion. The absolute irregularity, however, persisted in this case as well as in 2 other cases, although the cardiac action became slower. In another case of myocardial degeneration with cardiac insufficiency giving rise to dilatation of the heart with weak cardiac tones, a slight systolic murmur at the apex, small pulse with edema, and other manifestations of visceral passive congestion, digitalis was employed, after which improvement was noticed for a short time but was soon followed by decompensation and eventually by pulsus alternans. A glucose infusion seems to have had a beneficial effect; the pulse improved, the cardiac tones became louder and more distinct, and the attacks of shortness of breath diminished in number. The resulting temporary improvement in diuresis was remarkable. The edema had



entirely disappeared, and the general condition of the patient was so good that he could again be up and about.

The author has also employed glucose infusions in cardiac debility due to protracted febrile diseases, as in a case of extensive pneumonia with delayed resolution. On the fourth day of the disease, the right lower and middle lobes and the left lower lobe showed involvement, and the general condition of the patient was very poor. From this day on until the twenty-sixth day of the disease, the patient received daily 200 c.c. of 15 per cent glucose solution, with excellent results. Throughout the entire course of the disease the pulse and blood-pressure remained practically stationary.

Without exception, all patients who received the infusions showed subjective improvement, the precordial pains frequently disappeared entirely, and the attacks of angina became less common. The cardiac tones became distinct, and the adventitious sounds disappeared. There was no change in the rapidity of the pulse, nor in the blood, although in 1 case of *pulsus alternans* the alternating character of the pulse disappeared. In no case was sugar found in the urine.

Some of the untoward effects were: relatively frequent rises in temperature (in 6 cases) from 37.5° to 38.5° C. (99.6° to 101.4° F.) and over 39° C. (102.2° F.) (in 2 cases) on the day of the infusions. After twenty-four hours temperature became normal again. A similar rise in temperature was noticed by other observers, and inasmuch as all the infusions were administered under the most rigid antiseptic precautions, the author is inclined to attribute these to the stimulation of the heat center by the glucose solution, analogous to that observed when saline infusions are used. In 2 cases, chills, without a rise in temperature, were observed, and in 1 case severe pain in the chest immediately after the injection. During the infusion most of the patients complained of vertigo. This was, in all probability, due to the effect of the hypertonic solution on the vasomotor centers. The author has also noted, in 1 case, severe cramp-like pains in the region of the small of the back immediately after the infusion. Büdingen has met with similar cases.

All in all, the author thinks that this method of treatment has, in some cases of cardiac disease, given sufficiently good results to be considered a definite beneficial therapeutic agent, which may be employed in conjunction with other methods hitherto in vogue.

M. KESCHNER.



SWEET, E. A., AND GRANT, C. V.: Ivy and Sumac Poisoning.  
*Public Health Reports*, Feb. 27, 1920, xxxv, No. 9, pp. 443-458.

Certain species of the *Rhus*, or sumac, family exert a poisonous action upon the skin of susceptible persons. There are several of these species, including the vines and shrubs known as poison ivy and poison oak and also the poison sumac shrub or tree, but these plants are closely related and possess certain peculiarities by which they may be distinguished. Poison ivy and poison oak occur as woody perennial vines, or as low erect plants, or as trailing shrubs and are most readily recognized by their leaves, which are always divided into three leaflets, and by their smooth whitish waxy fruits (resembling mistletoe berries), which vary in size from one-eighth to one-fourth of an inch in diameter, and contain a single stony seed. The commonest of the various names applied in different localities are poison ivy, poison oak, mercury, picry, climbing or trailing sumac, and poison vine. Poison ivy or poison oak in one or various forms grows in practically all parts of the country except at elevations of over 6,000 feet and in arid land.

Poison sumac grows in moist ground, usually in swamps or along miry banks of streams and ponds. It is found from the New England States south as far as Florida and west as far as Minnesota, Arkansas, and Louisiana. It is called poison dogwood, poison elder, poison oak, thunderwood and poisonwood. It may grow on a tree ten to twenty or even thirty feet in height with a trunk five to ten inches in diameter, but it is more abundant on a shrub with slender clustered stems. The trunk has smooth, light gray bark. The young twigs are reddish brown at first, turning to orange brown by the end of the first year and later to the gray color of the trunk. The leaves are from seven to fourteen inches long and consist of a slender stalk bearing from seven to thirteen leaflets arranged opposite in pairs on short stems, the terminal leaflet having a longer stem. The leaflets are of an elongated oval shape, with entire margins. The flowers are yellowish green and appear in narrow drooping clusters growing out of the angles of the leaf stems near the end of the branches. The fruits are shining ivory white or yellowish, globular in shape, somewhat resembling those of poison ivy and oak, and containing a single yellow grooved stone. The fruit of the harmless sumacs are on upright terminal spikes, and are red in color. There is a difference of opin-

ion with regard to a rare form of sumac with red fruit, occasionally found in North Carolina and Georgia. It is considered poisonous by some writers and harmless by others. A near relative of the poison sumac is the poison wood, or hog gum-tree, of the West Indies and Southern Florida, where it is known as coral sumac. Its sap is dangerously poisonous to touch. Inflammation of the skin is reported to have been caused by mere proximity to the plants.

*Nature of the Poison.*—The toxic agent in these various species of *Rhus* is apparently the same—toxicodendrol, an oily principle which can be extracted from all parts of the leaves, roots, flowers and green fruits, with the possible exception of the pollen and ripe fruit. The minutest quantity of this oil can produce poisoning, hence a very slight contact with the growth or even with an intermediate agent, as clothing, implements, or animals, may serve as sufficient exposure. While there is reason to believe that the nonvolatile toxicodendrol is the sole toxic principle, it was formerly supposed that *Rhus* poisoning was due to volatile emanations from the plants; and even at present the question is not entirely settled. Smoke from burning plants which contains a finely divided but heavy dose of the toxin, gives rise to some of the worst cases of *Rhus* poisoning.

*Susceptibility.*—Certain individuals have a marked degree of resistance to the action of *Rhus* toxin, but there is good reason for believing that absolute immunity does not exist. The reaction depends upon the susceptibility of the person and upon the dosage of the toxin. Freshly bruised stems or leaves are more dangerous than when intact. For the same reason, plants are more poisonous in the spring when the acrid juice is abundant, though they retain their toxic property long after drying. Poisoning from old herbarium specimens is not uncommon.

*Symptoms.*—The time elapsing between exposure and the development of symptoms varies from a few hours to five days or longer. The parts of the body most exposed, such as the hands, the forearm, the face, and the feet and legs of barefoot children, are most often attacked, but other parts are often involved by the conveyance of the irritant through the agency of the hands, clothing, or bath.

The earliest symptom is a slight itching or burning sensation, which may become very intense. Scratching spreads the poison. Actual throbbing pain may be present in severe cases or in cases in which there is infection with pus germs.

The skin eruption is varied. It may consist of reddening and swelling, but more often there are vesicles containing serum, which may coalesce to form large blebs. When these rupture, a weeping effect is produced similar to that in acute eezema. In severe cases there are pustules. Scab formation is common in the later stages. Desquamation of varying degrees occurs from a few days to a week after recovery. Very pronounced swelling and edema of the parts involved often occur, but this condition usually terminates quickly.

*Prevention.*—Rubber gloves form the best protection, but thick gloves with gauntlets to protect the wrist may be used. Gloves or clothing which have come in contact with the leaves may convey the infection for an indefinite period unless they are thoroughly cleansed. Cotton-seed, olive oil, or vaseline, applied to exposed parts are of some protective value. These must be carefully removed. The use of soap and hot water as soon as possible after exposure is of great prophylactic value. Only the exposed areas should be immersed, and these should be thoroughly cleansed with successive pledgets of gauze, the water being changed frequently. Alcohol and water—equal parts—is also of value. Bathing, improperly performed, may spread the toxin to other parts or drive it into the deeper tissues.

*Treatment.*—If the skin is highly inflamed or if the eruption is extensive, the patients should be kept in bed in a cool room, with thin clothing, which does not irritate the inflamed area. The bowels should be kept open with a saline, and the diet should be light, consisting of fruit, cool drinks, etc. Constitutional symptoms, such as pain, headache, and sleeplessness should be treated as indicated. There is no specific treatment for the eruption itself. The irritation is self-limited, subsiding in a week or ten days.

Immersion in hot water for several minutes has a soothing effect in the case of itching. Bandages should not be used unless necessary. If they are used, they should be kept moist with a solution of soda or borax (from 1 ounce to 4 ounces, or from 31.10 grams to 124.40 grams). A 10 per cent solution of hyposulphite of soda, magnesium sulphate, or a lotion of from 1 part of the fluid extract of *Grindelia* to 10 parts of water may also be used as a wet dressing. The use of sugar of lead is not recommended on account of the danger of lead poisoning. Hot solutions of 1 or 2 per cent permanganate of potash (1 per cent if the skin is broken) are used by many. The stain may be removed with lemon juice.



The blebs should be opened, under sterile precautions, and the serum, which is harmless, expressed. In the late stages mild boric acid or zinc oxid ointment is useful.

*Importance of Destroying Poison Ivy.*—Rhus poisoning results in considerable incapacity and economic loss in addition to the bodily discomfort which accompanies the poisoning. Therefore individuals and communities should persist in their efforts to destroy these plants, until they are completely successful.

*Method of Eradication.*—Working with the plants is least dangerous in the fall. Isolated clumps of poison ivy may be grubbed out, care being taken to remove the running root stocks. In fields the plants may be destroyed by plowing the soil and planting cultivated crops. The plants may also be killed by repeated mowing.

Kerosene or crude oil may be used on the plants; it may also be used around the roots, after the soil has been cut up sufficiently to expose them. One thorough application of kerosene administered with a sprinkler or spraying pump is sufficient in many cases.

Arsenite of soda, from 1 to 2 pounds to 10 gallons of water, may be used to kill poison ivy on walls, buildings, or on large trees. It destroys small trees and other vegetation as well, and is poisonous to horses and other live stock. Hot brine (3 pounds of salt to a gallon of water) may be applied every ten days or two weeks during the spring and summer. The use of concentrated sulphuric acid or other strong chemicals is not advised on account of the danger to the user.

J. B. NEAL.

BRAM, I.: The Non-operative Treatment of Toxic Goiter. *International Medical Clinics*, 1919, 29th series, ii, 241.

Bram remarks that the profession at large is now more prone than formerly to seriously consider non-surgical procedures in the treatment of hyperthyroidism. Some of the reasons for this tendency, are:

- (1) The high mortality in advanced cases.
- (2) The disagreement among surgeons in regard to the adoption of the proper surgical procedure; some surgeons practice total thyroidectomy, some sympathectomy, some ligation of one or more



thyroid vessels, some thymectomy, others partial resection of the thyroid, and still others a combination of these operations.

(3) The numerous accidents resulting from surgery, e. g., the accidental removal of the parathyroids, followed by tetany, the removal of too much thyroid, with subsequent myxedema, the wounding of the laryngeal nerves, with paralysis of the vocal cords.

(4) The occurrence of status lymphaticus and of postoperative acute exacerbations of hyperthyroidism.

(5) The infrequent failure to secure relief following operation, the danger to which the patient subjects herself in undergoing an operation, the scar, and the frequent regeneration of the goiter itself, leading to a multiplicity of operations with a renewal of all the dangers incident to the first operation.

The points in favor of non-operative procedures are:

(1) Internists devoting their time to thyroid therapy report little if any mortality in the case of patients whose recuperative powers are still sufficient at the time treatment is begun.

(2) Most authorities agree that thyroid hyperactivity is only an incident in the general endocrine disturbance of the body, and that a surgical attack in the thyroid gland is, generally speaking, contrary to clinical and physiological reasoning.

After these introductory remarks, the author cites in detail the histories of 5 typical cases of toxic goiter, taken at random from his files, which he treated medically and which were all cured without any operative procedure whatever.

He insists that each case requires *individual treatment*, which cannot succeed unless the exact cause of the condition is determined and removed prior to beginning the treatment. In one case, for example, he found that excessive "spooning" in a young woman of twenty-four, with the consequent rousing of the emotions, had an important bearing upon the condition. In another case pregnancy was a determining factor, etc.

In general he orders, in most of the cases, complete or partial rest; the avoidance of undue mental and physical exertion; a lukewarm bath at bedtime each day; two hours' rest after each meal, and at least eight hours sleep at night; quiet surroundings at home.

Animal foods are reduced to a minimum; the chief articles of

food are milk, buttermilk, sweet cream, sour cream, cottage cheese, cream cheese, plenty of bread and butter, cereals, potatoes, soups (rice, barley, vegetable, noodle, and the like, without meat extracts), vegetables and fruit in season. The following substances are prohibited: tea, coffee, cocoa, ice-water, carbonated waters, alcoholic beverages, spices, pastries, sweetmeats, strawberries, raspberries, huckleberries, watermelon, cantaloupe, and the various canned foods. The patients are instructed to eat very slowly, never to overload the stomach, but to eat five or six partial meals rather than three full meals a day.

Locally he prescribes the following ointment:

R	Unguenti hydrargyri oxidi rubri	℥ii (7.50 c.c.)
	Lanolin	℥ii (60. c.c.)
M.	et ft. ung.	

Sig: A portion the size of a bean to be rubbed over the goiter area, until absorbed, every night, then a small quantity to be smeared lightly on the goiter and neck, and wound around with a cloth, which is removed in the morning.

or

R	Camphor-menthol	℥i (3.75 c.c.)
	Tincturæ belladonnæ	℥iv (15 c.c.)
	Tincturæ iodi	qs ad ℥i (30 c.c.)

Sig: Paint lightly over thyroid gland once daily.

or

R	Unguenti potassii iodidi	℥i (30. c.c.)
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Sig: A small portion the size of a bean to be massaged into the thyroid gland until the skin is dry, every night.

or

R	Menthol	
	Camphoræ	aa grains v (0.324 gram)
	Tincturæ belladonnæ	
	Tincturæ iodi	aa ℥ii (60. c.c.)

Sig: Paint lightly over goiter every night or every other night, according to the toleration of the skin.

In addition to any one of these ointments he prescribes the following capsules:

R	Quininæ hydrobromidi	grains v (0.324 gram)
	Ferri arsenatis	grain 1/12 (0.0054 gram)
	Ergotin	grain i (0.065 gram)

In capsules No. 1, t. i. d. p. c.

or

R	Quininæ hydrobromidi	grains v (0.324 gram)
	Sodii nitritis	grain i (0.065 gram)
	Extracti hyoseyami	grain 1/3 (0.0216 gram)
	Aloin	grain 1/10 (0.00648 gram)
	Veronal	grains ii (0.13 gram)

In capsules No. 1, t. i. d.

or

R	Quininæ hydrobromidi	grains v (0.324 gram)
	Extracti belladonnæ	grain 1/8 (0.0081 gram)
	Extracti glandulæ suprarenalis	grains ii (0.13 gram)
	Ferri arsenatis	grain 1/12 (0.0054 gram)

M. and Ft. capsules No. 1, t. i. d. p. c.

The addition of the drugs besides the quinin hydrobromid, in each case, depends of course upon the presence of special symptoms, such as extreme restlessness, high or low blood-pressure, etc.

This treatment is supplemented by the application for ten minutes of a high frequency current over the thyroid gland through a glass vacuum electrode three times a week, or less, depending upon the seriousness of the case. For the exophthalmos the same electrical treatment is employed, by means of a binocular glass vacuum electrode, twice a week for ten minutes each time.

Bram concludes from his experience that practically every case of true Graves' disease is completely and permanently curable by non-operative procedures which aim at restoring the functional balance between the various organs and the structure of the body. This can be accomplished within from six to eighteen months with properly applied hygiene, dietetic, medicinal, electrotherapeutic, and psychotherapeutic measures. According to him surgery is indicated only in:

(1) Secondary goiter ("Basedowified") in which a thyrotoxi-

cosis is superadded to an old preëxisting non-toxic goiter. Here the thyrotoxicosis should be eliminated before operation is attempted.

(2) Exophthalmic goiter suspected of being malignant (a very rare occurrence).

(3) Exophthalmic goiter with troublesome pressure symptoms, which as a rule are rarely met with in true Graves' disease.

M. KESCHNER.

ROLLESTON, SIR H.: Lumleian Lecture on Cerebrospinal Fever. *Archives of Diagnosis*, July, 1919, xii, No. 1, p. 1; also *Archives of Diagnosis*, Oct., 1919, xii, No. 2, p. 61.

After a careful study of the disease, as it developed in the Royal British Navy and Army during four years of the recent war, and in view of the statistics as compiled by the other Allied Forces, as well as after a careful review of the literature, the following points are emphasized:

It is an epidemic disease breaking out under favorable conditions into epidemics. The vast majority of cases occur during the first six months of the year, for the carrier-rate and the power of spreading the infection both increase at this time. So far man is the only recognized transmitter of infection. The carrier-rate is ten to twenty times higher than the incidence of the disease; a 20 per cent carrier-rate is considered a danger signal. Fifty per cent of cases occur in the first five years of life. Sex is not a definite factor.

The actual spread of infection is promoted mainly by droplets expelled from the nasopharynx. The meningeal invasion is now considered to occur in the majority of cases, probably in the following sequence: A local infection, then general blood infection, and lastly a meningeal metastasis, especially through the choroid plexuses of the lateral ventricles, rarely through the cribriform plate of the ethmoid or sphenoidal fissure.

The incubation period is believed to be short; from one to five days; and it is generally agreed that carriers are rarely attacked.

CLINICAL FORMS: (1) *The fulminating type* is fatal within forty-eight hours or less. A purpuric eruption is almost constant, but herpes is rarely seen. Two forms are given: the purely septi-



cemic type without meningitis, mentally clear to the end; and the purulent meningitis type with rapid unconsciousness and death.

The meningococci may not be remonstrated in the cerebrospinal fluid until after death and then only in the cerebral ventricles in the base of the brain. The symptoms of collapse have been correlated with the hemorrhagic condition of the adrenal medulla for which the meningococcus has a predilection.

(2) The ordinary *acute type* is characterized by sudden onset; meningitic symptoms appear after a short interval.

(3) The *abortive type* includes those cases (*a*) which clinically appear as febrile purpura or as a subacute polyarthritis, with meningism going no further than a mild septicemic stage; it disappears completely within twenty-four to forty-eight hours; and (*b*) those cases with a sudden onset of symptoms which rapidly subside within two to six days; these cases, however, are prone to relapses and are seen more frequently at the end of epidemics.

(4) The *chronic type* occurs in the following cases: (*a*) those which are not treated, or, if treated, do not receive the appropriate serum, and the meningococcus infection is unaffected; (*b*) those with a meningococcus septicemia which may precede, follow, or occur without meningeal infection; (*c*) those with meningitic adhesions and with obstruction to the free circulation of the cerebrospinal fluid; these adhesions form closed cavities inaccessible to serum which is injected intrathecally. The communication between the ventricles and subarachnoid space (the foramina of Magendie and Luschka) is commonly sealed off, and the ventricles, if infected, cause a pyocephaly, or, if uninfected, a hydrocephaly. In rare cases a cerebral or subdural abscess may result.

Posterior basic meningitis of infants is a chronic encysted meningitis. Fever, tremor of limbs, and bulging of the anterior fontanel may be the only early symptoms.

**CEREBROSPINAL FLUID.**—In 75 per cent of the cases the cerebrospinal fluid is clear during the first twenty-four hours. The meningococcus is not demonstrated, or at least not until the flow is from the ventricles. There is rarely a turbid flow at first with subsequent clearing; in such an instance the meningitis has started in the cord. The turbidity varies from an opalescence to a thick pus. Admixture with blood is nearly always due to trauma. A subsequent tap shows it to be yellow with a sediment of the remains of red blood-

cells. A golden yellow fluid, without red blood-cells remains, denotes a stasis or a culdesac of the meninges. Chronic cases with intradural adhesions may show a yellow fluid. The pressure is greatest in the early stages, subsiding with an amelioration of the symptoms.

**CHEMICAL CHARACTERISTICS.**—Albumin, which is absent in normal cerebrospinal fluid, appears chemically as the result of inflammation. Its amount is a prognostic index; a small amount in the early stages points to a mild attack. It is less in chronic cases, but varies little in amount.

Diminution or loss of the reducing power varies directly with the cell-content of the fluid suggesting that the advent of leukocytes is responsible for the fall in the glucose content.

**MICROSCOPIC CHARACTERISTICS.**—In early stages the lymphocytes increase, and, if the patient survives, the polymorphonuclear cells soon predominate. As improvement occurs in the acute cases the predominating polymorphonuclear leukocytes diminish in number, soon equalling the lymphocytes with an eosinophil increase. In addition large mononuclear cells make their appearance.

**RASHES.**—During four years of the war 59 per cent of the epidemic cases developed rashes, not including herpes. It is suggested that this may be correlated with the great increase in Type B cases (Gordon's II and IV), an infecting strain of meningococcus specially prone to cause septicemia and extra meningeal metastases.

The cutaneous rashes accompany or soon follow the onset of the disease; there is an interval of two or three days before a herpes develops, in cases which show both. The characteristic rash is hemorrhagic, either small and petechial, or purpuric. The latter characterizes the fulminating cases. The eruption is presumably embolic and is evidence of the stage of blood invasion. Meningococci have been demonstrated in these emboli.

*Herpes* appears later than the initial rash, usually by the fourth day, and is of the labial type. It is considered an expression of the local action of the toxin rather than of the bacteria in the skin. Less frequently the zoster type occurs.

**JOINT LESIONS:** (a) Early synovitis is commonest and occurs usually in the septicemic stage before any meningitic symptoms appear. Several joints may be attacked and, though but little swollen, are very painful and show local heat and redness.

(b) Late cases are usually monarticular with much local swelling, little pain or local redness, and freedom from muscular spasm.

When the synovitis appears about the eighth day, it may be difficult to decide whether it is meningococcic or the first sign of serum sickness.

RELAPSES AND RECRUDESCENCE.—Recrudescences or intermittent relapses, or the return of symptoms before the patient has fully recovered from the disease, are very common and a patient may have several. They are usually manifestations of encysted meningitis. True relapses are rare. The symptoms are similar, but are milder than in the original attack.

L. B. ECKERSON.

RUDOLPH, R. D.: System in the Care of the Sick. *The Canadian Medical Association Journal*, Feb. 1920, x, 185.

In the consideration of the treatment of a case, the physician will find it best to follow a certain routine. The plan which Rudolph finds most valuable is the following: (1) diagnosis, (2) environment, (3) diet, (4) removal of the cause of the disease (Specific therapy), (5) symptomatic treatment.

(1) *Diagnosis*.—In determining what ails a patient, the physician must avail himself of any and all diagnosis aids. Some cases can be diagnosed completely by mere inspection, but this does not suffice for the therapist. The diagnosis of a case does not end with the recognition of the disease, but the patient must be considered from the point of view of his powers of resistance, previous disease, and organic or functional insufficiency of some organ. Perhaps these conditions may have little to do with the symptoms for which the patient seeks advice at the time he consults the physician, but still, in the treatment of the case, these factors, remote though they may appear, must be taken into account.

There are some slight conditions, often quite disabling, and difficult to name, which require treatment. It is easier and better practice to treat such conditions early than it is to wait until a disease which can be definitely classified, has been fully developed.

"Many diagnoses", says Rudolph, "pass through three stages, namely, the stage of possibility, of probability and then of certain-



ty." It is of the utmost importance that something be done for the patient during these days of uncertainty and delay; the treatment may be only symptomatic, but it is nevertheless necessary for the relief of the patient's suffering. A diagnosis may be right and the treatment, wrong, as judged by the accepted treatment of the day, and yet the patient may make an uneventful recovery. This is due to "*vis medicatrix naturae*," which, according to the author, is the doctor's best friend. The wiser the physician, the less he tries to interfere with this natural curative force.

It is, however, possible to go too far in the direction of trusting the case entirely to nature, the so-called expectant treatment. It has been well said that nature is careful of the race and careless of the individual.

(2) *Environment*.—After the examination has been completed and a definite diagnosis established, the physician must determine whether the patient may be allowed to go on with his daily occupation or be instructed to go to bed. The question of skillful nursing, isolation and similar points in treatment must be decided upon early in the condition.

**PERSONALITY OF THE PHYSICIAN.**—Many a successful practitioner of medicine owes his success more to his manner and method of handling patients, than to his scientific achievements. This is especially so in the treatment of neurotic patients. "A few cheerful words", says the author, "a hopeful view of the case expressed within the hearing of the patient or his friends, will often do more good than all the drugs that may be prescribed." In order that treatment may be fully effectual, the patient must have the most implicit confidence in his medical attendant.

All that a physician learns about a patient in his capacity of medical attendant, must be kept a secret. Generally speaking, a sick man has a right to know about his condition, but a tactful physician must see to it that, when the truth is told to the patient, it will not be detrimental to him. It will never do to immediately tell the patient or his near relatives and friends all the possibilities that the physician may suspect in the case.

Often patients will ask the doctor for the name of their complaint; the practitioner can frequently satisfy their desires without unduly committing himself. When a patient's condition is very serious and the practitioner does not feel that the patient should know



his condition, then it is always well to inform some near relative of the situation, both to protect the physician's reputation and to prepare the patient's friends for the worst. It is sometimes the doctor's duty to tell his patient that it is necessary for him to make a will. If he is met by the anxious question, "Then doctor, am I going to die?", the author may give the old reply: "It is surely better to live prepared than to die unprepared. A man never yet shortened his life by making his will."

When the worst seems inevitable, the physician should still be very chary about giving up all hope. We are all liable to make mistakes, and there are many patients alive who were given up by their physicians. Even when the worst seems very imminent, the physician should not commit himself to days or hours. To all questions as to how long the patient will live, guarded answers must be given. A good and true way is, according to Rudolph, to say that it all depends upon the sick man's power of resistance.

(3) *Diet*.—A certain amount of food is necessary to meet the caloric demands of the patient, although a patient confined to bed needs less nourishment than when he is up and about. The body always has a reserve supply and can tolerate a certain amount of starvation for a short period without perceptible damage. "Starvation cures" for fevers of long duration and for other chronic conditions should, in the author's opinion, always be looked upon with suspicion.

(4) *Specific Treatment (Removal of the Cause)*.—Emptying the stomach of an ingested poison, the removal of a tapeworm, administering quinin in malaria, salvarsan in lues, antitoxin in diphtheria, are methods of more or less directly attacking the cause of disease. Of a less direct but still similar nature is the use of vaccines for stimulating the patient's tissues to a greater effort in the production of antibodies. The use of these measures is constantly growing, but unfortunately the vast majority of human ills are still beyond such satisfactory methods of attack.

(5) *Symptomatic Treatment*.—By combating individual symptoms such as pain, sleeplessness, itching, etc., the patient's strength is conserved and his vitality maintained while nature is given an opportunity to exert its wonderful curing powers. "A symptom", states the author, "is usually a link in a vicious circle and, if this link can be broken, the patient may recover." It is a mistake to leave a patient for days without any treatment just because the di-

agnosis is not yet clear, or because it is only too clear, and the doctor believes the condition to be incurable. There is good and bad symptomatic treatment. Opium or its derivatives, freely given to relieve the cough and pain in dry pleurisy, is an instance of good symptomatic treatment. The same drug, however, when administered freely to relieve a cough due to increased bronchial secretions, represents bad symptomatic treatment. The patient's hope of recovery in the latter case rests upon his ability to cough up the mucus. Yet an opiate not only lessens the cough, but also tends to depress the respiratory center.

In many instances it may be fatal to administer opiates, inasmuch as they mask the symptoms before a diagnosis can be arrived at. This is particularly true in surgical abdominal conditions. When, however, the physician has decided to operate, the administration of a narcotic between the decision and the actual operation may prevent much unnecessary suffering, and is quite justifiable practice. In cases of inoperable malignancy it is absolutely the doctor's duty to administer opiates very freely. The question of making the patient a morphin habitué is of secondary importance when comparative comfort and, perhaps, actual prolongation of life may be secured.

M. KESCHNER.

RECTOR, F. R.: Human Engineering: A New Medical Specialty.  
*Public Health Reports*, Jan. 9, 1920, xxxv, No. 2, pp. 61-65.

A high labor turnover has led to many industrial accidents. This has resulted in compensation laws which have increased the demand for the industrial physician. This specialty is founded on the principles of preventive medicine, since one of its main objects is preservation of the worker's health. Industrial management is learning that it pays to keep a man well and happy.

The author prefers the term "Human Engineering" to "Industrial Medicine", since it defines more clearly the scope and possibilities of the work.

Among the 40,000,000 industrial workers of the United States, there are 2,000,000 accidents yearly which entail a loss of time of more than one day each. Almost 22,500 people are killed, and from

15,000 to 18,000 more are permanently disabled. This loss is estimated to be the equivalent of the working time of over 60,000 people. In addition each industrial worker is sick on an average of eight days per year; this is equivalent to the time of over 1,000,000 working people. The loss in wages is over \$1,000,000,000 per year, in addition to the loss in production and the cost of medical attendance. This shows the importance of medical supervision of industry.

In addition to medical knowledge the industrial physician must understand the industrial processes of the plant, the physical requirements for filling a certain job, and the hazards of the various departments. He must see that the working conditions are suitable, and he must also take an interest in the home and community environment of the workers. He, therefore, comes in contact with four departments of an industry—employment, safety, medicine, and welfare.

A knowledge of the requirements of the jobs will enable the physician to place the applicant advantageously, when he has made a physical examination of him (which should include some estimation of his intelligence and mental attitude). This examination will also exclude communicable diseases and will show defects, many of which might be corrected to the great benefit of the worker. One of the big problems the human engineer can help to solve is that of placing the handicapped worker where his services can be of most value to himself and to industry.

In the safety department he can often find the cause of accident—perhaps faulty position, poor ventilation, bad lighting, etc. Physical reexamination of workers in hazardous occupations will throw new light on the dangers and hazards of certain lines of work.

In his medical work he will not only care for accidents but he will relieve or eliminate the seemingly slight ailment which otherwise would lead to loss of time and productive capacity. Prompt attention to minor accidents by preventing infection saves much time.

There is opportunity for much welfare work in the home and community. Much may be accomplished by educational efforts, along the lines of personal hygiene, proper food and clothing and proper habits of mind and body. Questions relating to mutual-benefit associations, old-age pensions, recreational and amusement facilities,

community hygiene and sanitation, pure milk and water supplies, sewage disposal, etc., also come within the scope of the industrial physician. In addition, careful records are of great value.

The place of the industrial physician, or human engineer, is an important one. In addition to being the head of the medical department, he should be the administrative head of the industrial relation group, and should work in close harmony with the employment department, the safety department, and the welfare department.

J. B. NEAL.

CHAPIN, H. D.: Do Calories Measure the Value of Food? *Journal of the American Medical Association*, Dec. 27, 1919, lxxiii, No. 26, p. 1911.

The author takes the position that nutrition depends on something more than the heat-producing power of food. He believes that there is a physiological process included in the conversion of food into nourishment that cannot be measured by oxidation alone. He illustrates this by the fact that certain of the lower creatures, such as frogs, reptiles, leeches, etc., live without oxygen for considerable periods of time and that some insects can live in a vacuum for several days. He argues from these facts that the metabolism of the higher animals is in part aerobic and in part anaerobic. Experiments by Hart, McCollum, Steenbock and Humphrey, and quotations from Bayliss and Bunge are used in illustration of these facts. He concludes that the physician must recognize the need for choosing a food of *physiologic* value and that he must not depend on the caloric value alone, as the latter does not express its true nutritional value. He questions whether it is not time to abandon, at least in part, the caloric method of choosing a diet, especially in early life. He urges that "some form of biologic testing of foods must be elaborated if an always reliable gauge of nutrition is to be established."

H. G. WEBSTER.



## SECTION ON LABORATORY AND RESEARCH

LOEB, L.: A Comparative Study of the Mechanism of Wound-healing. *The Journal of Medical Research*. Jan., 1920, xli, No. 2, pp. 247-281.

Loeb presents a critical study of the factors involved in wound-healing based upon the comparative and quantitative studies of Addison, Spain, and Akaiwa, and also upon his own work during the past ten years. Changes, which take place in the epidermis in response to wound stimulus, consist of amoëboid cell movements, mitotic cell multiplication, increase in cell size, increase in thickness of the stratum germinativum, and increase in the number of cell rows and in the number of cells. These phenomena are seen as essential reactions of cells toward foreign bodies. Association of steriotropism and of a tendency toward centrifugal growth explain the extension of tissues, both reactions taking place in response to the same stimulus.

T. HOWARD.

SAILER, J., HALL, M. W. AND WILSON, R. L.: A Study of Pneumococcus Carriers. *Archives of Internal Medicine*, Dec., 1919, xxiv, No. 6, p. 600.

The authors examined 700 men of a regiment at Camp Wheeler by the following method. Smears were taken from the nasopharynx and spread upon blood-agar plates. If characteristic green colonies developed in the course of sixteen hours, they were transferred to the blood-broth medium of Avary and again incubated. After incubation the growth was examined by the Gram stain, tested for bile solubility, and the cultures that qualified were further tested

for type by the precipitin method. Sixteen per cent of the men examined proved to be pneumococcus carriers, and of these, 24 per cent harbored one or the other of the so-called fixed types. Eleven different methods of treatment of carriers were tried out. The best results were obtained with oily solutions of phenol and of iodine. The authors believe that all contacts with cases of pneumonia should be cultured and that the carriers should be treated. In the presence of an epidemic of pneumonia or diseases complicated by pneumonia, the authors believe, also that it is practicable to treat large numbers of men by the above methods.

T. HOWARD.

GANGULI, P.: Sodium Morrhuate in Tuberculosis. *Indian Medical Gazette*, April, 1920, lv, 131.

The author treated a total of 37 unselected Indian soldiers during the late Afghan War at Quetta Sanitarium, where the climate was dry, and the air free from dust, with 3 per cent solution of sodium morrhuate. This is a preparation made from cod-liver oil by extracting the unsaturated fatty acids and making a sodium salt. The cases showed manifestations of tuberculosis either in lungs, bowel tract, glands, skin, or in combination. The reported results are, without doubt, extraordinary; for example, 26 so-called pulmonary cases, with sputum positive for tuberculosis, gave results as follows: 8 were cures, 10 showed favorable improvement, 3 remained stationary, 4 are failing, and 1 died. In the other types there was a definite improvement of symptoms and "near cures". The author noted that body weight increased and expectoration grew more scanty even in the presence of pyrexia; he credits the preparation with bacteriolytic and probably fibrolytic action. The latter factor would contra-indicate its use in the quiescent case.

Although the series is small, the data lacking and incomplete, and classification, uncertain, these stated results are striking. The method of administration recommended is subcutaneous or intravenous; preferably, the latter. The initial dosage is  $1\frac{1}{2}$  c. c. about twice a week; this is increased gradually ( $1\frac{1}{4}$  c. c.). When 2 c. c. is reached, it is increased more rapidly ( $1\frac{1}{2}$  c. c.) and it is given

weekly. Four c. c. is the maximum dose. Cautious increase is required in cases of febrile tendencies.

Smith, Stanistreet & Co., Ltd., Calcutta, India, are listed as sole manufacturers of the preparation.

L. B. ECKERSON.

DEAN, A.: The Isolation of an Organism Resembling the Paratyphoid Group. *The Medical Journal of Australia*, Jan. 10, 1920, i, No. 2, p. 27.

In cases in Brisbane running an apparently mild typhoid course the author succeeded in isolating an organism which he classifies with the paratyphoid B. group. Very little of the clinical picture of the cases submitted could be obtained. Requests for the examination of the stools were usually made on the suspicion that the dysentery bacillus or amoeba histologica was the causal agent. The chief characteristics of the organism are given as:

- (1) It does not ferment lactose or dulcitol.
- (2) It produces gas in saccharose and raffinose.
- (3) It does not produce indol.
- (4) It produces acid in litmus milk on the fifth day, clots the milk on the tenth day, and clears it on the fifteenth day.
- (5) It has agglutinating powers similar to *Bacillus paratyphosus B.*

H. WOLFER.

CORLETTE, C. E.: Hydatid Infestation of Bone, Multilocular Hydatid Disease and Ordinary Hydatid Cysts. *The Medical Journal of Australia*, Jan. 24, 1920, i, No. 4, p. 73.

In a thorough discussion regarding the relation of multilocular (or alveolar) hydatid disease to the ordinary type, the author reports a case of the former variety presenting many unusual features. The patient, a man of 65, complained of pain in the right thigh and hip and of a swelling of the right thigh existing for a period of eight years. Physical examination showed the right leg

to be shorter than the left and it rotated outward only. A large, uneven tumorous formation extended from the inguinal region down the upper third of the thigh, being most prominent above. Another large mass was felt below the right gluteal fold. In the abdomen a large mass could be palpated just outside the right rectus and this extended from the inguinal region to the costal margin.

Incision of the soft mass in the inguinal region evacuated a large amount of material like milk-sago, consisting of enormous amounts of hydatid cysts. Examination of the cavity with the finger disclosed several sacculations, and a communication with another large cavity extending down the thigh. From the first cavity a small sac about the size of a walnut was removed and this contained the same material as was found in the large cavity. There was no evidence of a mother cyst present and scolices and hooklets were not found. Death followed bleeding into the large cavity posterior to the hip and was probably due to rupture of a large vessel following the release of the hydrostatic pressure.

At postmortem examination, the large cavity in the thigh was found to communicate with others about the head of the femur and these in turn communicated through erosions in the right pelvic bones and through the obturator with a large ramifying cavity extending from the pelvis to the liver, however the liver and right kidney remained uninvolved. The bones forming the right side of the pelvis were everywhere eroded and the head of the femur and the acetabulum were gone. The upper part of the shaft of the femur showed fracture and was tunneled by a cavity opening above and communicating with loculi about the head and dorsum of the ilium. The abdominal mass contained the same milk-sago material. The size of the largest individual cysts was 2 cm. in diameter, but these large cysts were few in number. Isolated and encapsulated cysts were found in the left thigh and right retro-peritoneal region, and one about the size of an orange was found between the liver and spleen. A multilocular hydatid of the right lung was found. This involved chiefly the apical and basal portions of the upper lobe. A few isolated outlying cysts were present and were separated from the larger mass by normal lung tissue.

The author notes that multilocular hydatid disease was first described by Virchow, previous to which it was regarded as alveolar colloid cancer. The liver, then, was the only organ known to be af-



fect. The cysts are usually sterile and contain neither scolices nor hooklets, due very likely to their small size, although these have been observed in some instances. In the racemose type the cysts appear to coalesce and the cavities to intercommunicate. In the mass calcareous deposits may be found and central degenerative areas, in those of larger size. Regarding the manner of growth some writers (Neumann especially) maintain that exogenous and endogenous budding are not found in the same echinococcus or in the same host, while others have regarded the multilocular variety as a different species not derived from the taenia echinococcus of dogs. Virchow, in an article on echinococcus disease affecting bone, believed the multilocular hydatid of the liver and bone were manifestations of the same disease and that the same parasite under different local conditions might give rise to the usual cystic formation or the multilocular variety. Thus the ordinary hydatid, developing in soft tissue with freedom to expand, formed the usual cystic type while developing within Glissin's capsule the multilocular type resulted. This explanation does not fit with the findings of the case under discussion, for in the left thigh, for instance, the small size could not be explained by compression. Corlette believes that nutritional disturbances constitute the chief factor in determining the size of the growth. The small size of the individual cysts in his case may be explained by rupture of the delicate cysts taking place as a result of body muscular movements, fracture of bone, etc.

Bone infection, as stated by Davies, probably takes place through the general circulation, the embryos first passing through the capillaries of the liver and then through those of the lungs. After lodging in the bone, growth takes place by peripheral spreading causing discalcification and erosion, while outpost formations coalesce with the production of large cavities.

The view of Melnikow-Raswedenkow that the parasite of *Echinococcus alveolaris* occupies an intermediate position between the *Cestodes* (tapeworms) and *Trematodes* (flukes) from its power of producing ameboid embryos *in loco*, is not substantiated by the conditions presented by Corlette's case. The bone and multilocular lung-involvement are each of rare occurrence and it would be extremely unlikely to find both types in the same organism or organ.

Corlette also notes that geographical distribution of a particular type in the animals of certain sections does not account for the type

found in the human cases. He shows that bone hydatid is similar in type to the cystic variety and that the multilocular lung-involvement of the case presented probably was secondary to the focus in the bone. The manner of distribution could be explained on the same basis as fat emboli occur after fracture of the bone, the multiplication of cysts in bone hydatid being due to rupture of fertile cysts and distribution of embryos therefrom. When a similar destruction takes place in the peritoneal cavity we have the condition of multiple peritoneal hydatids produced.

II. WOLFER.

VINES, II. W. C.: Anaphylaxis in the Treatment of Hemophilia. *The Quarterly Journal of Medicine*, April, 1920, xiii, No. 51, p. 257.

The author's first case was a hemophiliac child brought in for uncontrollable bleeding from a scalp wound. Local measures, horse serum, mother's serum, etc., finally effected a control. The coagulation time remained markedly delayed, however, and ten days after admission hemorrhage started from the same wound. Fearing that the patient might be in the anaphylactic state from the previous use of horse serum, an intradermal injection of two minims of serum was given as a test. A very strong local reaction occurred showing the anaphylactic state to be present. No further hemorrhage occurred. Twelve hours later coagulation time was normal, and an effusion in the knee joint rapidly cleared. Coagulation time remained approximately normal for the next thirty days. During this thirty-day period a second small injection of horse serum gave only a slight local reaction but further depressed the coagulation point. This patient later was found to have lost his sensitiveness to horse protein; this condition was probably due to the continued use of the serum. The patient was sensitized to sheep serum and the anaphylactic local reaction was produced, with the same rapid fall in coagulation time. No symptoms of general anaphylactic shock were elicited. The effort of this local reaction became very rapidly generalized, for the injection was made into the skin of the right arm, and the blood was obtained for examination from either ear a relatively short time afterward.

Two other case reports are given and these show similar results. In order to control the foregoing observations, the reaction of a normal individual when in the anaphylactic state was observed. This normal control was sensitized to normal sheep serum and it was found that the intradermal injection of the antigenic protein within the anaphylactic period was capable of causing an increase in the blood coagulation rate of the normal individual.

In the first and second cases of the author (both sensitized to horse protein), the first remained with a normal coagulation time for twenty-nine days; the second has remained normal for forty days. In the matter of coagulation time Case 1 showed a greater deviation from normal than Case 2.

*Conclusions.*—(1) The intradermal reaction is a modified form of anaphylactic "shock," of general as well as of local significance, in which the stimulation of the thrombogenic functions of the somatic cells is a salient feature.

(2) The changes in coagulability of the blood in anaphylactic "shock" occur in two stages: a period of acceleration which occurs early, and a period of retardation which follows the former. The duration of these phases depends directly upon the severity of the shock.

C. F. NICHOLS.

FRY, H. J. B.: The Use of Immunized Blood Donors in the Treatment of Pyogenic Infections of Whole Blood Transfusions. *British Medical Journal*, Feb. 28, 1920, No. 3087, p. 290.

Blood donors, of the universal type, Class 4, were injected with a mixed streptococcus and staphylococcus vaccine for about a month, and their blood was transfused into patients with severe local and general streptococcus or staphylococcus infections. Of the 6 cases of septicemia so treated only one recovered; vaccine was also used in this case. With 3 chronic local infections recovery followed very promptly after transfusion from these immunized donors, and the rapid change for the better suggests that the treatment was of decided benefit to them. Of the septicemias, nearly all were moribund when the treatment was begun, and it was instituted as a last resort.

L. C. JOHNSON.



CANNON, W. B.: Studies on the Conditions of Activity in Endocrine Glands. V. The Isolated Heart as an Indication of Adrenal Secretion Induced by Pain, Asphyxia and Excitement. *American Journal of Physiology*, 1919, 1, 399.

The author gives an interpretative introduction to the paper which puts the purpose of the paper concretely, "Knowledge of the conditions under which the endocrine glands become active, or manifest increased activity, is important for several reasons. Such knowledge is valuable as an extension of our acquaintance with a realm of physiology which is still largely unexplored. It permits correlated studies of other bodily processes which vary under the same conditions. And it gives a basis for inquiry into the functions performed by the endocrine glands, for the service of an organ should be reasonably looked for in relation to the times of its special activity. With such ideas in mind, the present series of studies was entered upon."

The points of issue are as follows: Cannon and his workers had previously produced evidence that the adrenal medulla is stimulated to excrete by emotional excitement, by pain and asphyxia. It has been previously shown to be subject to sympathetic stimulation by way of the splanchnics, and as excitement, pain and asphyxia were conditions recognized as accompanied by sympathetic activity, an attendant adrenal secretion was naturally to be expected. They next showed that adrenal secretion was useful in lessening muscular fatigue and in accelerating the coagulation of the blood. An interpretative paper pointed out that excitement, pain and asphyxia were conditions which in natural existence would commonly be associated with struggle, and that visceral changes, including adrenal secretion, which accompany these three states, would be useful in great muscular effort. Thus a new view was presented of the function of the sympathetic division of the autonomic system and of the adrenal medulla in important bodily adjustments.

These views have been seriously questioned, both the evidence and the interpretation, by Stewart, Rogoff and others. They report that the discharge of adrenin is continuous and in any animal approximately constant, and that the supposed variation is due to the rate at which the blood flows through the lumbo-adrenal veins. They find no increase of secretion in pain, asphyxia or in emotional excite-



ment. Gley and Quinquand claim that adrenin is not secreted in sufficient amount to be carried effectively to the organs on which it may act and that therefore no true adrenalinemia exists.

The present paper is a re-examination and testing of the evidence for the author's theory of adrenal secretion in pain, asphyxia and excitement. He reaffirms his conclusions after such a critical examination and makes a detailed criticism of the Stewart and Rogoff conclusions. He considers that their work was done under experimental conditions which could not afford information regarding the normal secretion of the adrenal glands or the natural conditions affecting that secretion.

The paper is concluded with an interpretation of the function of the adrenal medulla. In this the author notes that the view that the adrenal glands produce some substance which neutralizes toxic material developed in the body has been discarded, and that two theories remain, the tonus theory and the emergency theory. The former holds that the function of the secreted adrenin is to maintain the sympathetic endings in a state of responsiveness to nervous stimulation or in a condition of moderate activity or tone. This theory has been shown by several workers (cited) to be without experimental support. The emergency theory, proposed by Cannon, lays emphasis on the association between adrenal activity and the activity of the sympathetic division of the autonomic system in such emergencies, but he calls attention to the fact that nowhere has the statement been made that secreted adrenin possesses a function separate from that of the nerve impulses, except to increase the irritability of fatigued muscles and to speed the coagulation of the blood. No claim has ever been made that there is at any stage a primacy of adrenin in the production of the physiological or psychological changes observed during strong emotion.

W. H. EDDY.

LEVINE, E. C.: Indication for and Results of Transfusion. *The Canadian Medical Association Journal*, Jan., 1920, x, 34.

This paper is based on a series of 54 cases of transfusion carried out by Levine at the Royal Victoria Hospital in Montreal. The most favorable results were obtained in hemophilia, primary hemorrhage,

postoperative hemorrhage, jaundice where surgical intervention was necessary, puerperal septicemia and pernicious anemia prior to splenectomy.

Transfusion in pernicious anemia appeared to have a temporary beneficial effect, but where splenectomy was to be performed, it was beneficial in sustaining the patient's strength, when resorted to prior to operation.

*General Indications for Blood Transfusion.*—Transfusion is indicated in all conditions in which the blood supply has been depleted, especially where operative procedures are contemplated. This fact was forcibly brought out in the treatment of severe injuries during the war.

*Specific Indications for Blood Transfusion.*—Primary and secondary hemorrhage, hemophilia, sepsis, typhoid perforation, puerperal septicemia, diseases of the gall-bladder associated with jaundice, gastric ulcer with hemorrhage, and post-operative bleeding.

In primary as well as secondary hemorrhage transfusion of fresh blood is useful because it increases the coagulability of the patient's blood in addition to replacing the large volume of blood lost. The same reasons apply to its usefulness in hemophilia. In gall-bladder conditions with obstructive jaundice, general oozing of blood often takes place at the site of operation with the formation of large bloody extravasations. In these cases it is very difficult to control the hemorrhage, and transfusion of the whole blood by increasing its coagulability is nearly always unusually beneficial.

*Post-transfusion Reaction.*—In transfusions with the citrate method, one nearly always gets a reaction which is manifested by a rise of temperature, rigors and a general feeling of discomfort; these subside generally in a few days. Similar reactions, though milder in nature, occur occasionally with the whole blood method. In one case of pernicious anemia the author saw jaundice follow the chill and rise of temperature, all of the symptoms disappearing at the end of one week. Two of his patients, in which a hemoglobinuria followed transfusion, died.

*Quantities of Blood to be Given.*—In cases of loss of blood in which the predominating condition seems to be toxæmia, small quantities of blood are to be given, because it is not a question of replacing the blood, but rather one of combating the toxæmia. As a matter of fact, in these toxæmias, the cardiac muscle shows marked cloudy swel-

ling; hence it is inadvisable to expose this organ to any additional strain, which might be followed by acute cardiac dilatation.

In cases of hemorrhage in which the circulation has been impoverished through loss of blood, much larger volumes of blood may be given. In ordinary conditions the average quantity of blood given is about 600 c. c. The author has given as much as 1100 c. c. without any ill effects.

No blood should be given to a patient without a preliminary hemolytic or agglutination test. For the technic of these tests the reader is referred to the original article.

M. KESCHNER.

DAWSON, P. M.: Effect of Physical Training and Practice on Pulse-rate and Blood-pressures During Activity and During Rest, with a Note on Certain Acute Infections and on the Distress Resulting from Exercise. , *American Journal of Physiology*, 1919, 1, 443.

Training affects resting pulse-rate, blood-pressures, and their derivatives as follows: The pulse-rate is slowed, especially the noon and afternoon pulses, the extent of the diurnal variation is increased, the diurnal variations of the systolic pressure increase, diastolic pressure approaches the daily mean, while diurnal variations are much decreased; the form of the daily curves of blood-pressures are not obviously altered; the product of pulse-rate x pulse-pressure is usually increased, however the character of its daily variations remains unchanged.

A trained individual accomplished more work with less apparent exertion and less subjective distress, in spite of the fact that the systolic pressure rose higher, the pulse-pressure increased enormously, and with it sometimes the product of the pulse-rate and the pulse-pressure. The diastolic pressure returned more quickly to normal, and the pulse-rate was sometimes less affected than in the untrained subject and probably returned to normal sooner.

During an acute infection (nasopharyngitis) there was an increase in pulse-rate, but no change in the blood-pressures. In the trained subject the change in pulse-rate was much less pronounced. Under this infected condition, exercise caused a greater increase in

pulse-rate than in the normal individual, and the work accomplished was less.

The feeling of distress during exercise showed no relation to the heart-rate and blood-pressure, determined at the cessation of exercise. When distress followed exercise, it had no relation to the blood-pressure present at the time, but the heart-rate was found to be greatly decreased.

W. H. EDDY.

TRAUGOTT, K.: The Influence of Ultraviolet Rays on the Blood (Über den Einfluss der ultravioletten Strahlen auf das Blut). *Münchener medizinische Wochenschrift*, March, 1920, No. 12, 344.

It was previously assumed that the increase of hemoglobin and red blood corpuscles in high altitudes depended upon these rays. The same phenomenon occurs in rarefaction chambers. Light is not essential for the maintenance of the number of red blood corpuscles and percentage of hemoglobin. This has been proved by Grober and Sempel by blood examinations of horses in mines. Polar explorers during the long nights, showed no changes. Naegeli's opinion is that light has no influence on hematopoiesis. This was born out by these experiments.

Normally, there is no difference in the number of leukocytes in the capillaries and in the venous blood. After a fifteen-minute exposure to the rays, the number of white blood corpuscles increased 61 per cent in the capillary blood and 56 per cent in the venous blood. An average of 30 cases showed an increase of 18 per cent in the capillary and 15 per cent in the venous blood. The percentage increased to the maximum one-half hour after exposure and gradually declined to the normal six hours later. The differential count remained unchanged. The change does not depend upon variations in blood concentration or volume of the cells. Do the rays act on the normal factors which increase the formation of white cells? Does this increase depend upon more rapid oxygenation? The process is too rapid for this as the cells are fully formed. Are there depots for white cells outside of the normal hemoblastic areas? Against this assumption would be the normal relationship of the differential count



after exposure. Of course this also depends upon whether the dualistic origin of the white blood corpuscles is accepted or whether one adheres to the unitarian doctrine of Maximow. According to Lazarus, tissues with larger atonic weights are receptors, carriers and transformers of radiant energy. The cell nuclei of the white blood corpuscles increase the atonic weight, and, therefore, these react much more than the non-nucleated reds.

*Influence on Coagulation.*—There seems to be no uniformity of opinion as to the normal coagulation time. This seems to depend upon the method used and upon the reading of the beginning and completion of coagulation time. The following factors must be taken into consideration: (1) Use venous blood (non hyperemic); (2) use the same amount of blood for each determination in contact with the same amount of surface area; and (3) temperature must be constant. With the observance of these rules the normal coagulation time is usually from five to six minutes. In 44 cases the coagulation was lessened by 25 per cent; in 31 cases, it remained unchanged; in 6 cases, it was prolonged. The blood-platelets showed changes corresponding to the coagulation time.

The action of these rays may be summed up as follows:

(1) They have no influence on the percentage of hemoglobin and red blood corpuscles.

(2) There is distinct increase of white blood corpuscles particularly in capillary blood.

(3) There is diminution in coagulation time.

H. JOACHIM.

Ivy, A. C.: Contributions to the Physiology of the Stomach. III. Studies on Gastric Ulcer. *Archives of Internal Medicine*, Jan., 1920, xxv, No. 1, p. 6.

Chronic ulcer of the stomach or duodenum in healthy dogs is rarely found. Healing of experimental ulcers produced by the submucous injection of silver nitrate occurred in the fundus in from nine to thirteen days, near the pylorus in from twelve to eighteen days, in the duodenum in from sixteen to twenty-four days. Ligation of branches of the gastro-epiploic vessels failed to produce ulcers,

and the injection of charcoal into these arteries also failed, while the injection of lead chromate (possibly toxic) sometimes succeeded. Induced partial pyloric stenosis somewhat delayed the healing of experimental ulcers. Injection of streptococci into the gastric vessels failed to produce ulcers as did feeding large quantities of virulent bacteria, in the case of healthy dogs in which abrasions of the mucus membrane had been made. On the other hand, 3 dogs which were suffering from distemper all developed chronic ulcers when fed bacteria after injury of the stomach. The same result was obtained with 1 of 2 dogs in which the pancreatic duct had been ligated. These experiments suggest that the production of a chronic ulcer requires some injury to the mucosa, infection by mouth or blood stream, a general lowered resistance, and a temporary hypo-acidity. These factors were apparently present in the successful cases of other experimenters.

Disturbances in motility and emptying time seen in chronic ulcers can be duplicated experimentally with acute ulcers, and were studied by this writer. Ulcers of the pylorus and of the duodenum caused hypermotility and delayed emptying time, while ulcers of the fundus did not show this effect. In order to determine the source of this hypermotility, the extrinsic nerve supply was eliminated by cutting both vagi and splanchnics and extirpating the celiac plexus. An increase in motility was still observed, but was not as great as before the section.

T. HOWARD.

GREGG, H. W., LUTZ, B. R. AND SCHNEIDER, E. C.: Compensatory Reactions to Low Oxygen. *American Journal of Physiology*, 1919, 1, 302.

In this paper the authors consider the relative values of compensatory reactions of low oxygen tensions. They call attention to the fact that men differ in sensitiveness to lowered oxygen and in the power to make physiological adaptations which will, from a decreased supply, provide sufficient oxygen to maintain tissue and body efficiency. The majority of men appear to make a well-balanced use of the three mechanisms for supplying oxygen. The ventilation of the lungs, the rate of blood flow and the percentage of red corpuscles and

hemoglobin are definitely increased. Their data show an inter-dependence and an interplay of the three mechanisms when a subject is held under constant low oxygen tension.

As shown in earlier papers, the effects upon the blood circulation and respiration were the same with the three methods used for providing low oxygen tension, and consequently they required in these experiments (47 in number) only a constant oxygen tension through the holding period. The summary of the results follows:

(1) During a period of gradual reduction in oxygen partial pressure at a rate approximately 5 mm. per minute, the respiratory and cardiac centers are ordinarily stimulated by about the same fall in the oxygen pressure. In some subjects the first response began at an oxygen partial pressure of 147 mm., in the majority, between 128 and 113 mm. In some men the circulation responded before the respiration, and in others the order was reversed. The compensations during the period of reduction, which lasted from fifteen to twenty minutes, were made entirely by the circulation and respiration.

(2) The compensations during an exposure to a constant low oxygen tension were classified as follows: (a) those in which the pulse-rate, after maintaining a high level for a while, diminished slowly and the percentage of hemoglobin increased; (b) those in which the pulse, after a primary rise, maintained a constant rate, while the hemoglobin increased; (c) those in which the pulse-rate diminished after the primary rise, and the hemoglobin did not increase; (d) those in which the pulse-rate, after the primary rise, remained constant and in which the hemoglobin did not increase. The compensations were distributed among these groups as follows: (1) 55 per cent; (2) 19 per cent; (3) 9 per cent; (4) 17 per cent.

(3) During an exposure of from thirty to one hundred and forty-five minutes to low oxygen tension, the percentage of hemoglobin usually increased in twenty minutes or more. When this occurred, and when the compensation which had been made by the respiratory and circulatory systems was adequate, the circulation or the respiration, or both, decreased as the hemoglobin restored the pulse-rate to normal, that is, the pre-experimental rate. In one case the respiration even returned to normal.

(4) The interdependence of the three compensatory reactions

was shown also in a few cases in which an increase in breathing, following a period of equilibrium in circulation and respiration, resulted in a retardation in pulse-rate and blood-flow.

(5) Several individuals compensated in the same manner and in about equal degree in two or more experiments. One man compensated differently in each of four experiments.

W. H. EDDY.

BLUMENTHAL, F., AND VON HAUPT, A.: Immunization Processes in Human Trichophytosis. *Deutsche medizinische Wochenschrift*, Jan. 8, 1920, xlv, No. 2, p. 37.

The authors summarize their conclusions on this subject as follows:

- (1) In most of the cases of deep trichophytosis complement-forming antibodies could be demonstrated in the blood serum.
- (2) Only in rare cases could the presence of these antibodies be demonstrated in cases of superficial trichophytosis.
- (3) Generally speaking, the quantity of antibodies was in direct proportion to the severity of the clinical manifestations.
- (4) Allergic reaction and antibody-formation frequently occur together but do not always run parallel to each other.
- (5) Preliminary injection of trichophytin has a substantial influence upon the formation of antibodies. Several cases so treated exhibited complement-fixation reactions. The therapeutic effect of these injections depends in part upon their power to stimulate the formation of antibodies. The antibody, as well as the allergic reactions, are not, strictly speaking, specific. They may be found in cases of non-parasitic sycosis, and tuberculous adenitis; occasionally trichophytin antigen gives a positive reaction with syphilitic sera.
- (6) It is certain that there is no pure cellular immunity limited to the skin, which would place trichophytosis in a special group among the infectious diseases. Humoral immunity processes play an important rôle in trichophytosis.

M. KESCHNER.



MEIROWSKY: Report of the Salvarsan Commission of the Medical Society of Cologne (Bericht der Salvarsankommission des allgemeinen ärztlichen Vereins in Köln). *Münchener medizinischer Wochenschrift*, April 23, 1920, No. 17, 477.

On the conclusion of a paper presented by Meirowsky, Secretary to the Medical Society of Cologne, on March 11, 1918, a commission was appointed by Dr. Moritz and Dr. Zinsser to study the untoward effects of salvarsan injections. The members of the commission consisted of two internists (Moritz and Auerbach), two otologists (Preysing and Hopmann), two ophthalmologists (Probsting and Hoppe), two neurologists (Aschaffenburg and Liebmann), two dermatologists (Zinsser and Meirowsky), and one pathologist (Franck). The statistics of 182 physicians of Germany, Austria, Holland, and Denmark were compiled for one year. Two hundred and twenty-five thousand seven hundred and eighty (225,780) injections were reported—13,000 old salvarsan, 40,954 sodium salvarsan, and 171,826 neosalvarsan. The following were considered as untoward effects: Fever, if over three days' duration; cutaneous, renal and hepatic (jaundice) symptoms; gastro-intestinal disturbances of more than three days' duration; nerve disturbances such as encephalitis; early onset of tabes and general paresis after injections; and deaths.

The greater part of the report considers the twenty deaths which were attributed to the injections directly (12 cases), questionably (5 cases), and indirectly (3 cases) from pneumonia and sepsis. The proportion of deaths in relation to all injections was 1 to 11,289. Out of 13,000 old salvarsan injections there were two deaths. With sodium salvarsan (dose up to 0.6 gram) there were five deaths to 3,970 injections. With doses above 0.6 gram there was one death to 1,250 injections. With neosalvarsan (dose up to 0.6 gram) there were 7 deaths to 162,792 injections. Above 0.6 gram, there were five deaths in 9,035 injections. Males and females were equally divided.

The greatest number of deaths (9) occurred after the second or third dose. Of the ten deaths due to encephalitis, two were attributed to old salvarsan, three to sodium salvarsan, and five to neosalvarsan. Five patients died of dermatitis.

The direct unpreventable deaths for all injections were summarized as follows: 1 death to 18,815 injections. Old salvarsan 1 to

13,000; sodium salvarsan 1 to 20,000; neosalvarsan 1 to 162,800.

There were 50 cases of jaundice which was three times more common after old salvarsan than after neosalvarsan.

H. JOACHIM.

ALVAREZ, W. C., AND STARKWEATHER, E.: XVIII. Conduction in the Small Intestine. *American Journal of Physiology*, 1919, 1, 252.

In previous papers these authors have presented evidence of a metabolic gradient in the intestinal wall from duodenum to ileum. They have shown that per unit of weight and time the duodenal muscle gives off more  $\text{CO}_2$  than does the ileal and that this is not due to its greater activity. They express the belief that this metabolic gradient underlies and gives rise to gradients of rhythmicity, latent period and irritability which determine the direction of the diastolic waves. The present paper investigates the influence of the metabolic gradient upon the conduction of stimuli up and down the intestine. The expectation was that stimuli would travel faster and farther with the gradient than against it. Most of the experiments were done on the small intestine of the rabbit, but many were also performed on the bowel of the cat. Rat intestine was so insensitive to stimuli as to be rejected for use. In some experiments the stimulation was given by pinching or by application of NaCl crystal. The most convenient and the only measurable stimulus was the faradic shock. In most of the tracings the movements recorded are those of the longitudinal muscle. The results with the lesser experiments on the circular muscles, however, were about the same as for the longitudinal muscles. The conclusions reached in this paper are based upon an analysis of over 2,200 reactions, 1,000 each on the excised and on the intact intestines; 1,700 were the result of electric stimuli, 400, the result of pinches and cuts, and the remainder the results of stimulation with salt crystals and ballooning. The results confirm the expectations—conduction is better with the gradient than against it. The rate could not be determined accurately. It appears to be about 22 cm. per second. At times it is about 150 cm. per second, probably by way of the nerves in the mesentery. In the rabbit the peristaltic rushes travel about 4 cm. per second. The characteristic

response to a stimulus applied to the gut is a contraction above and below. This may be preceded or followed by an inhibitory phase. The "myenteric reflex" was rarely observed, and then usually after distention by ballooning. The authors state that "it may easily be that the 'myenteric reflex' is primarily a response to stretching and not a response to other forms of stimulation of the gut." The tone and activity of any part of the tract may be markedly affected by activity of other parts. With the exception of the terminal ileum, no part of the bowel seems to affect the rate of rhythmic contraction of adjacent parts. This is contrary to Keith's theory of peristalsis. The failure of strychnin to influence conduction or to alter the type of response to stimuli suggests that Auerbach's flexus is a simple nerve-net, without synapses or reflex arcs.

W. H. EDDY.

ELLIS, M. M.: Respiratory Volumes of Men during Short Exposures to Constant Low Oxygen Tensions Attained by Rebreathing. *American Journal of Physiology*, 1919, 1. 267.

The respiratory volumes of 29 men during the reduction of oxygen tension by rebreathing and during short exposures to constant low oxygen tension following the period of rebreathing, were studied in connection with the sea level respiratory volumes. An increase was noted at the end of the fifth minute of rebreathing, at an average of 18.1 per cent oxygen (approximately equivalent to 4,000 feet altitude) in 23 of the 29 subjects. The minute-to-minute respiratory volumes suggested that this increase may occur even earlier in the rebreathing period. The author cited the explanation of Haldane, Meakins and Priestley, viz., that the first result of diminution of the percentage of oxygen is an increase in the depth of respiration, owing to a lowering of the threshold of exciting value of carbon dioxide. This explanation, applied to the experiments reported, would call for a change in the carbon dioxide threshold very early in the rebreathing reduction of oxygen. The early response noted in the experiments seems to confirm this explanation.

The respiratory volume during the first ten minutes of the exposure to constant low oxygen tension, varying from 5,000 to 21,000

feet equivalent altitude, was greater than the sea level volume in 32 of the 36 cases. The respiratory volume of 17 of the 36 cases fell during the first ten minutes of the exposure to constant low oxygen tension to a volume lower than that secured during the reduction of oxygen by rebreathing, although it was still greater than the sea level respiratory volume. These 17 cases include all but one of the cases subjected to an oxygen-level equivalent to 10,000 feet or less. This fall in respiratory volume during the first ten minutes of exposure to constant low tension oxygen was apparently correlated with compensations to low oxygen advantageous to the subject. The return to sea level oxygen tension was followed by a prompt return to the sea level respiratory volume.

W. H. EDDY.



## SECTION ON PEDIATRICS

LYNAH, H. L.: Influenzal Croup. *American Journal of Diseases of Children*, Oct., 1919, xviii, No. 4, p. 238.

By means of direct laryngoscopy and bronchoscopy the author was able to classify a syndrome which he terms "influenzal croup". Heretofore the majority of such conditions had been diagnosed diphtheritic laryngeal stenosis. Four types are distinguished:

(1) The laryngeal type is very similar to the diphtheritic condition. At times a whoop is present. This gives a combined picture of pertussis and diphtheria. Intubation is often necessary.

(2) The tracheobronchial type is characterized by a tracheobronchitis for a few days; this is followed by respiratory difficulty and croup. The latter conditions are due to extensive subglottic and tracheal edema, and to the presence of a glue-like mucous which may be blood-streaked. The larynx appears normal. The symptoms are often relieved by passing a tube.

(3) The bronchopulmonary or asthmatic type presents a fulminating onset, often resembling certain forms of blood anaphylaxis. There is extreme dyspnea, the lungs are engorged with blood and bronchoscopic examination shows only congestion of the mucosa, with perhaps a small amount of blood-tinged mucous. This type is often fatal within a few hours, however aspiration through the bronchoscope may afford relief if there is much secretion. The engorged inelastic lung and not bronchial spasm, accounts for the asthmatic attack. Epinephrin by hypodermic injection may afford relief.

(4) The pneumonic type occurs with signs of air hunger.

Seven cases are reported in more or less detail with explanatory

plates illustrating the above types from a clinical and roentgenoscopic standpoint.

The article emphasizes the importance of the use of direct laryngoscopy and bronchoscopy in differentiating upper respiratory conditions of a croupy nature.

T. B. GIVAN.

LOZANO, A. R.: A Case of Generalized Postdiphtheritic Paralysis. *Archivos espanoles de pediatria*, April, 1920, iv, 208-217.

Aurleio Romeo Lozano reports an interesting case of the above condition in a boy of three years which responded promptly to the administration of five thousand units of antitoxin intramuscularly for four doses. This would seem to refute the claim of Menabouni and others that the serum is inefficacious in paralysis which occurs late. Statistics show that the average dose of the antitoxin administered to cases of diphtheria at the present time is four thousand units of antitoxin, as compared with an average of fifteen hundred given in 1896, and that in this period of time the incidence of postdiphtheritic paralysis has fallen from 21.5 per cent to 12.6 per cent.

W. H. DONNELLY.

RAMOS, A. A.: Pneumococcic Tonsillitis. *Archivos espanoles de pediatria*, May, 1920, iv, 273-278.

The symptomatology of this condition includes in rare cases an initial chill, and usually fever, dysphagia, nausea and vomiting. The tonsils are at first simply swollen and red, but soon there is seen upon them a slight white exudate, which is not adherent. Although it may involve only a portion of the tonsillar surface, on the other hand, the membrane may extend over the pillars and uvula, much the same as a diphtheritic membrane. If the membrane be extensive, the virulence of the infection is evidenced by pronounced enlargement of the cervical glands, and by great swelling of the tonsils.

The glands in the submaxillary space become greatly swollen and the urine becomes scanty, although there is no albuminuria. The

diagnosis must be made in the laboratory by finding the presence of the pneumococcus. The duration of the disease is from fourteen days up, while most tonsillar infections last not more than ten days. The prognosis in such cases should be guarded, especially since pneumonia may develop at the end of ten days. In treatment general measures may be instituted, such as rest in bed, hot fomentations, antiseptic gargles, steam inhalations, milk diet and heart tonics. By using antipneumococcic serum Ramos obtained temporary improvement, but he noticed no ultimate effect upon the course of the disease.

W. H. DONNELLY.

GORTER, E., AND TEN BOKKEL HUININK, A.: Active Immunization against Diphtheria. *Archives de médecine des enfants*, Paris, 1920, xxiii, 338.

In spite of the use of serum there have been from 400 to 481 deaths from diphtheria annually in Holland for the past seven years. A review of the literature on the use of toxin-antitoxin mixtures indicates that an excess of toxin is necessary for immunization and that those individuals with a low titer of natural antitoxin and who are in the most need of immunization respond badly to injections. The authors at the Children's Clinic at Leyden, Holland determined the antitoxin content of the blood (Römer's method) and did Schick reactions (the intradermal injection of one-fiftieth of a minimal lethal dose of diphtheria toxin for a guinea pig) in 19 diphtheria patients and normal individuals, before and after injections of toxin-antitoxin. They also did Schick reactions on 380 children from six to twelve years of age in a school which had had 20 cases of diphtheria and 60 carriers of diphtheria bacilli. (In a total of 411 pupils, 31 were excluded as being ill, either with diphtheria, impetigo or tuberculosis). 271 of the remaining 380 pupils had positive Schick tests and were then immunized by injections of diphtheria toxin-antitoxin; 109 had negative Schick reactions. It was presumed that these latter had at least one fiftieth of a unit of natural antitoxin and did not require immunization. Hahn's method of immunization was used, i. e., the intradermal injection on the anterior surface of the fore-arm of 0.1 c.c. of a one-twelfth dilu-

tion of toxin-antitoxin mixture VII (or a one fiftieth dilution of toxin-antitoxin VI). If this produced a local reaction of the second degree at the site of injection (an infiltration of 2 cm. or more of the skin which is red, slightly swollen and painful on pressure without general symptoms or swelling of the regional glands), the same dose was repeated after an interval of from ten to fourteen days. If the first injection produced a slighter reaction, 0.1 c. c. of a one-fourth dilution of toxin-antitoxin VII was injected two days later, and if this did not produce a second degree reaction, 0.1 c. c. of undiluted toxin-antitoxin VII was injected two days later.

In all cases, from ten to fourteen days after obtaining a second degree reaction, the dose that had given this reaction was repeated. On only one child was there the slightest unfavorable reaction and in this case there was a swelling of the arm glands which completely disappeared two days later. The local reaction was greatest in those patients who had the least natural antitoxin. There was no correlation between age and intensity of reaction. No difference was noted between the reactions of the children who were carriers of diphtheria bacilli and those who were not. In the majority of the 19 individuals in whom the amount of antitoxin produced by the injections of toxin-antitoxin was determined, it was found to be increased. In the serum of 4 individuals an increase of antitoxin was noted from three to eleven days after the last injection of toxin-antitoxin; in 4 after from fourteen to nineteen days and in ten after the twentieth day. No increase in antitoxin was found during the interval between the two injections. This antitoxin disappeared in from one and one-half to two years.

The Schick reaction was positive in 10 children having less than one one-hundredth of a unit of antitoxin in their sera; it was negative in 15 having between one-fiftieth and one unit of antitoxin, while in those who had exactly one one-hundredth of a unit of antitoxin, the reaction was negative in 2 and positive in 4 cases, but these latter tests were often not clear. Of the 271 children who had positive Schick tests before immunization with toxin-antitoxin, the reaction remained positive after the immunization in 40, became doubtful in 49, and was completely negative in 138.

It was therefore concluded that antitoxin was produced in the majority of the children by injection of toxin-antitoxin. Among the 40 children whose Schick reactions remained positive, there



were only 2 carriers of diphtheria bacilli, while among the 187 others there were 38 carriers. The authors believe that the presence of diphtheria bacilli in the throat favored the production of antitoxin by injection of toxin-antitoxin. As a result, this antidiphtheritic immunization, along with the closing of the school for a month, disinfecting the building and the books and excluding carriers from the school, the number of diphtheria cases was limited to 2 during the following year. One of the above cases had had a negative Schick reaction and so was not immunized; while the other had had a positive Schick test before immunization and a feebly positive test after immunization. This second case was very mild and occurred one year after immunization. Nine children in whom the antitoxin produced by the immunization had disappeared after one and a half to two years were reinjected with toxin-antitoxin. Two days later the antitoxin content of their sera had increased. This fact suggested that, possibly because of cellular immunity, vaccinated individuals, even after two years, react more quickly to new injections of toxin-antitoxin than unvaccinated individuals, for it was found that unvaccinated persons did not produce antitoxin until after a lapse of 21 days from their first injection.

W. C. DAVISON.

LOOFT, C.: Discussion on Tetany in Children at the First Congress of Scandinavian Pediatricists at Copenhagen, Aug. 15 and 16, 1919. *Archives de médecine des enfants*, Paris, April, 1920, xxiii, No. 4, pp. 257-260.

*Infantile Tetany.*—Jarloev (Copenhagen) reported that in a great number of cases of tetany, due to deficiency of the parathyroids, he was led to believe that an alkalosis existed which was not produced by calcium or sodium but by the nitrogenous bases arising from the decomposition of albumin, which bases, under normal conditions, were destroyed by the function of the parathyroid glands. Under these circumstances a régime without milk was of great importance.

Bojesen (Copenhagen) reported the results of a large number of experiments on the therapeutic effect of calcium salts ( $\text{CaCl}_2$  and  $\text{CaBr}_2$ ) and magnesium sulphate. Large doses of calcium chlorid had the predominating effect without reducing the milk intake.

Af. Flerker (Lund, Sweden) reported experiments which he had made with Jeppeson on the spasmogenic effect of cow's milk; they found this effect to be due to the anions, especially the phosphate ions.

Paul Iberson (Copenhagen) stated that the spasmogenic effect of phosphates had its origin in their ability to combine with the calcium of the body. Toxicological and other experiments which he had made with Lenstroup speak against a phosphate intoxication.

Lenstroup (Copenhagen) reported experiments made on the acid soluble phosphates of the plasma. The greatest quantity was found in the newly-born and in breast-fed infants; a smaller quantity in normal infants and those artificially fed, and the least amount in cases of acute rickets. During convalescence from rickets he found the quantity increased. In tetany there was no difference during the attack and after cure.

W. C. DAVISON.

PELFORT, C.: The Superior Longitudinal Sinus as an Intravenous Route in Children. *Archivos españoles de pediatría*, March 1920.

J. Bravo Frias and J. A. Alonso Munoyerro write that Marfan in 1898 was the first to employ this method.

The great difficulties attending the utilization of the veins in small children prompted Marfan to make use of the superior longitudinal sinus which is so easy of access in those months of life during which the anterior fontanel is open. The following indications are enumerated:

(1) Hemorrhagic diseases, melena neonatorum, hemorrhage of the cord, transfusion of blood.

(2) Cases of extreme atrophy where the introduction of a five per cent solution of dextrose may save the child.

(3) Injection of diphtheria antitoxin or of anti-tetanic serum in cases where urgent action must be taken.

(4) Antisiphilitic treatment by means of neosalvarsan.

(5) Injections of alkaline solutions in acid intoxication.

(6) Administration of heart stimulants as caffen and adrenalin.

W. H. DONNELLY.

PELFORT, C.: Five Cases of Meningitis in Nursing Babies. *Archivos espanoles de pediatria*, March, 1920.

These patients varied in age from twenty-two days to ten months. Four were boys and one was a girl.

Two cases were pneumococcus infections; one was probably tuberculous, one streptococcus, and one pneumococcus, associated with other bacteria. All cases resulted in death.

W. H. DONNELLY.

HUTCHISON, H. S.: Fat Metabolism in Health and Disease with Special Reference to Infancy and Childhood. *The Quarterly Journal of Medicine*, April, 1920, xiii, No. 51, p. 277.

The conclusions reached after careful work follow:

(1) The digestion of fats in infantile atrophy, rickets, and tetany is carried out as efficiently as in healthy children.

(2) The fat output in the feces varies directly with the fecal weight and forms approximately one-third of this.

(3) There is a slightly greater loss of fat in infantile atrophy, due to the motions being larger than in healthy children, but the excessive loss, which amounts to 0.88 gram per day, can be neglected as far as nutrition is concerned. There is no true deficient absorption.

(4) In rickets, the excess loss of fat per day over that in healthy children averages 0.6 gram, an amount which is sufficient to affect nutrition.

(5) In tetany the excess loss is 2.4 gram per day. This is due chiefly to the passage of larger motions than normal; viz, 14.4 grams compared with 9.9 grams. To a less extent it is due to a true deficient absorption, since the fat in the feces averages 38 per cent. This loss is insufficient to affect nutrition.

(6) Other facts point to a normal fat absorption in atrophy; viz, the increased amount of fat absorbed with an increased intake, and the fact that improvement frequently follows the lowering of the fat content of the milk.

(7) Saponification of fats in the intestine does not affect the absorption of fats.

(8) The fairly constant percentage of fat in the feces of man and other animals suggests that fecal fat has a function to perform, and that it is not a pure excretion. There is no evidence, however, to indicate what this function is.

C. F. NICHOLS.

SAINT-PHILIPPE, R.: Prophylaxis and Treatment of Digestive Disturbances in Bottle-fed Infants. *Proceedings Académie de médecine de Paris*, May 25, 1920; reported in *La Presse médicale*, May 29, 1920, xxviii, No. 35, p. 349.

Bottle-fed infants are less vigorous and less resistant to disease than those who are breast-fed. They frequently develop a dyspepsia, which may result in a severe gastro-enteritis. The physiologic inferiority and the dyspepsia are caused by the imperfection of their digestive powers, their assimilation and nutrition, resulting from the difference in chemical and biologic properties between cow's and human milk. For this reason, weaned infants have a predisposition to infections and intoxications.

To prevent these imperfections, and to reëstablish a normal equilibrium, a drug is necessary which acts simultaneously on the digestive juices and on the agents of fermentation and putrefaction. The author has found the tincture of ipecac, in small doses to be very valuable.

S. KAHN.

NOBECOURT, E., AND STEVENIN, H.: Late Complications of Appendicitis (Gaseous Subphrenic Abscess and Retrocolic Abscesses). *Archives de médecine des enfants*, Paris, 1920, xxiii, 353.

The authors report the cases of two boys of thirteen years who were suddenly seized with abdominal pain, vomiting and fever, symptoms suggestive of appendicitis. These signs disappeared rapidly, although the patients continued to have diarrhoea and became emaciated. When they came under the author's treatment one month later, there was no suggestion of appendicitis and no definite diagnosis was possible on clinical grounds at that time. The x-ray, how-



ever, revealed in one case a gaseous subdiaphragmatic abscess which ruptured spontaneously the next day into the intestine and bronchi. The abscess was drained two days later but the child died. In the second patient a retrocolic tumor, which increased in size for some days, was palpated and diagnosed as a collection of pus. This was confirmed by operation. This second child improved but had a persistent fistula. The conclusion drawn is that early operation would probably have prevented this late suppuration in the latter child.

W. C. DAVISON.

DE LOS TERREROS, C. S.: Pancreatic Infantilism (Infantilismo pancreatico). *El Siglo médico*, March 27, 1920, No. 3459, 221.

The author reports a case of what he thinks is pancreatic infantilism. There are many different varieties of the condition, but the simplest classification follows: essential, without determined or known cause; symptomatic, the mere expression of a pause in the development, which pause is provoked by intoxication or infection; and endocrinous, the most common form. The author admits that all forms of infantilism have a more or less marked endocrinous course. Infantilism is always accompanied by a primitive or secondary alteration in the internal secretion of the genital organs. The special character of the different kinds of infantilism is given by the concomitant endocrinous alteration. Thus we have thyroideal infantilism, suprarenal infantilism, pituitary infantilism, etc. Among these is pancreatic infantilism. This form is more frequently found among children. We must, however, not forget that infantilism represents merely arrested development and that it may be observed in adults as well as in children.

The pancreas is very delicate in childhood, and the mildest intoxication or infection provokes in children a transitory glycosuria, the cause of which lies in alterations in the pancreatic function due to the intoxication. According to this, infantilism (Noorden) is produced in children by the degeneration of the pancreas and by the destruction of the islands of Langerhans. The features of pancreatic infantilism are: secretory pancreatic digestive insufficiency, arrest of all development, with the characteristics of infantilism, and

normal hydrocarbon metabolism. All those features were present in the case discussed by the author. The case also occasionally showed sugar and acetone in urine. The clinical aspect presented the following feature: the weight curve remained stationary. This explains also the presence of an alteration in the pancreas, tending to produce a greater protein disintegration and an enormous destruction of fat. This process could be recognized, in the urinalysis, by the presence of uric acid and of urea in great quantities.

Children suffering from this condition present a status thymicus lymphaticus. All lymphatic organs were hypertrophic in the case discussed (Lingual follicles, tonsils, swollen glands). The blood picture was characteristic: anemia, mononucleosis, and often leukopenia.

The last feature of pancreatic infantilism is a decreased resistance to sickness. The children thus affected contract all diseases. According to the author, this depends upon the alteration of the autonomous and vegetative systems, and also upon fact that the glandular trouble tends to alter the chemical or humoral medium, thus impairing the anti-infectious and antitoxic functions of the organism.

C. F. ARROYO.

SECTION ON  
ROENTGENOLOGY AND ELECTRO-  
THERAPEUTICS  
COLLECTED ABSTRACT OF THE LITERATURE ON  
ROENTGENOLOGY FOR THE YEAR 1919

By I. SETH HIRSCH

DISEASES OF THE THORACIC VISCERA

*(Continued from page 677)*

*Hemorrhagic Pneumonitis*

John Hunter Selby (Roentgen-ray Studies during the Recent Influenza Epidemic. *The American Journal of Roentgenology*, May, 1919, vi, No. 5, p. 211) defines this disease as an acute localized toxic inflammation of the cells lining the alveoli, bronchioles, and their capillaries, producing a hemorrhage into the open air passages. The coëxisting intrathoracic complications were encountered in order of frequency as follows:

- (1) Interlobar pleuritis.
- (2) Pleurisy with effusion.
- (3) Mediastinal adenitis.
- (4) Cardiac enlargement.
- (5) Empyema.
- (6) Pericardial effusion.
- (7) Lobar pneumonia.
- (8) Diffuse mottling.
- (9) Plastic exudate.
- (10) Mediastinal empyema.

*Roentgen-ray Examination.*—In the earliest stage demonstrable by the roentgenogram, hemorrhagic pneumonitis is recognized as a faint filmy haze opposite the level of the lower angle of the scapula. The mesial portion of haze is partially obscured by the outer portion

of the normal hilum shadow. This hazy area is enlarged in all directions, and frequently it is observed that the adjacent portions of the upper and lower lobe are involved simultaneously. The process may advance so rapidly as to include the greater portion of all lobes in the same side of the chest within forty-eight hours. In fulminating cases, all five lobes may be involved and death ensue within forty-eight hours. Hemorrhagic pneumonitis invariably begins as a unilateral process, and in 82 per cent of the author's cases the left lung was primarily involved. It was never seen to begin in any peripheral portion of a lobe, but invariably appeared in the region of the lung roots. It was also noted that the involvement never began simultaneously in two or more widely-separated areas, but that it was found to spread from the original site. Later it may develop around the roots of a lobe on the opposite side. The true apex and the lower borders of the lower lobes were never involved in these cases. In other words, it was found that in every case in which the roentgenogram showed a haziness or a total density over the apex or costophrenic angle, this was indicative of a pleuritic complication or of lobar pneumonia. In the vast majority of cases we found pleural effusion to be responsible.

The serial roentgenographs proved that the process invariably commenced in the central portion of the lobe nearest the hilum. Later it spread in all directions simultaneously.

The 470 cases are divided into the following groups:

- (a) Hemorrhagic pneumonitis (uncomplicated). These presented the typical hazy spreading shadow. No discrete mottling is present, nor is there any conspicuous enlargement of the mediastinal glands. No pleuritic complications are present.
- (b) Hemorrhagic pneumonitis associated with a conspicuous enlargement of the mediastinal glands, but without discrete mottling.
- (c) Hemorrhagic pneumonitis associated with discrete mottling, but without conspicuous enlargement of the mediastinal glands.
- (d) Hemorrhagic pneumonitis associated with conspicuous enlargement of the mediastinal glands and with a definite discrete mottling over the pulmonary area.



- (e) Hemorrhagic pneumonitis complicated by some form of pleural involvement, pericardial involvement and mediastinal empyema.
- (f) Adenitis unassociated with hemorrhagic pneumonitis, discrete mottling, or any other form of pulmonary or pleural pathology discernible by the roentgen-ray.
- (g) Adenitis and fibrosis unassociated with other intrathoracic pathology discernible by roentgen-rays.
- (h) Adenitis without hemorrhagic pneumonitis or discrete mottling but associated with some other intrathoracic pathology.
- (i) Discrete mottling of the pulmonary area uncomplicated by hemorrhagic pneumonitis, enlargement of the mediastinal glands, or any other intrathoracic pathology discernible by roentgen-rays.
- (j) Discrete mottling associated with conspicuous enlargement of the mediastinal glands unassociated with any other intrathoracic pathology discernible by roentgen-rays.
- (k) Mottling unassociated with hemorrhagic pneumonitis and enlargement of the mediastinal glands, but associated with some other intrathoracic pathology.
- (l) Hemorrhagic pneumonitis associated with pulmonary tuberculosis.
- (m) Hemorrhagic pneumonitis associated with lobar pneumonia.
- (n) Lobar pneumonia uncomplicated by hemorrhagic pneumonitis.
- (o) Cases in which there was definite clinical evidence of pulmonary pathology but in which the serial roentgenographs failed to confirm the presence of a pulmonary lesion.

Naturally the cases presenting a discrete mottling offered the greatest difficulty in interpretation. This was found to be due to discrete interstitial lesions, commonly held to be streptococcic in origin. In Selby's cases the sum total of mottled types was so small as to be conspicuous.

The total number of patients studied roentgenologically was 470. Of these 82 per cent, or 386, presented hemorrhagic pneumonitis complicated or uncomplicated by one or more of the intrathoracic conditions already noted. Of the remaining 84 patients, 33

failed to show any lung pathology discernible on the roentgenogram, although clinically there was evidence of so-called bronchopneumonia. Seven had mediastinal adenitis (group *g*), 13 had uncomplicated mottling (group *i*); the remaining 31 could not be classified, as the presence of fluid completely obscured the original pathology.

In the cases which came under roentgen-ray observation early enough, the hemorrhagic process was found to appear primarily in the left lung in 82 per cent.

Group (*a*) included a few cases in which autopsy revealed a small amount of pleural fluid, which was not present roentgenologically twenty-four hours before death. Presumably this developed as a terminal process. The importance of serial roentgenograms in influenza has been amply proven in this clinic, their chief value lying in the detection and identification of pulmonary complications in the early stages.

### *Pleural Effusion*

W. H. Stewart (A Study of the Condition as Revealed by the Roentgen-ray Streptococcus Empyema. *The American Journal of Roentgenology*, Feb., 1919, vi, No. 2, p. 57) states that there is a great tendency toward the formation of sub-pleural abscesses in the lung inflammations due to the *Streptococcus hemolyticus*; the involvement of the pleura is secondary to the pulmonary lesion, and is probably caused by a rupture of one of these abscesses in the pleural cavity. The pleural effusion appears during the course of the lung involvement and is not postpneumonic, a condition which we are accustomed to see in the pneumococcus infection. The symptomatology, physical diagnosis, roentgen-ray examination, and aspiration, all come into play in making the diagnosis, and it is only by a complete correlation of the findings of these different diagnostic methods that we can hope to arrive at a correct conclusion.

The early pleural effusions appear in the axillary space; they climb up between the parietal and visceral pleurae until the apex is reached. They may be observed roentgenographically as a ribbon-like shadow of increased density, with a sharp inner border appearing in the outer zone of the chest, and, as the fluid increases, this shadow increases in width and extends down to the diaphragm. This peculiar roentgen finding continues until the effusion is nearly com-

plete, when the entire side is filled with a dense shadow. At this time only is there a distinct displacement of the mediastinal contents to the opposite side.

It is the opinion of the Empyema Commission, headed by Major Edward K. Dunham, that this class of cases should not be operated on until the effusion has become frankly purulent and the patient has recovered from the pulmonary lesion; exception is made only in cases of acute pneumothorax, when surgical measures are urgent. Lung-pressure symptoms and displacement of the heart are meanwhile relieved by aspiration. The number and frequency of chest aspirations are determined by the rapidity of the reaccumulation of the fluid.

The change in the character of the fluid occurs, as a rule, in from two to three weeks, by which time adhesions have had an opportunity to form. This prevents a complete collapse of the lung when the pleura is opened. The adhesions may have resulted in a sacculation of the fluid, so that it is essential before operating that the surgeon should have as accurate a localization of the exudate as is possible. This can be accomplished only by a thorough fluoroscopic combined with a stereoroentgenographic examination, confirmed by aspiration. As a rule this examination should be made on the day of the contemplated thoracotomy.

The Commission recommends the immediate institution of the Dakin treatment as soon as the pus is evacuated. For the first few days a simple suction apparatus is applied, which permits of a frequent irrigation of the empyemic cavity with Dakin solution. It also provides for free drainage. As soon as the patient is able to be up and around, the wound is dressed daily until the cavity becomes sterile, the case being constantly under bacteriological control.

Every effort is made to assist in the expansion of the lung by such auxiliary measures as the use of blowing bottles, mild exercises, etc., so that in most cases, by the time the cavity has been rendered sterile, the visceral pleura has become adherent to the parietal layer, obliterating the cavity; the small remaining sinus is then allowed to close. While the lung is expanding, frequent roentgen-ray examinations should be made, preferably by the stereoscopic method, the roentgenograms acting as a permanent record of the favorable progress of the case.

If the lung fails to expand completely on account of pleural thick-

ening and adhesions, it leaves a cavity of varying size which can only be closed by further operative measures. Valuable information as to the existing conditions in these cases can be given to the surgeon by the roentgen-ray examination.

Stereoroentgenographic examination, after the injection of some substance opaque to the roentgen-ray, has been found to be of value in certain cases with large cavities complicated by auxiliary sacculations, and which, on account of their peculiar configuration, are notoriously difficult to sterilize.

The persistence of small draining cavities or sinuses is due to the following:

- (1) Sequestration of the rib.
- (2) The formation of a fibrous or bony wall around the sinus.
- (3) Prolonged retention of the drainage tube.
- (4) Imperfect drainage.
- (5) The presence of a pleuropulmonary fistula.
- (6) A rigid-walled cavity which prevents the expansion of the lung.
- (7) The presence of foreign bodies.

The roentgen-ray examination, both with and without injection, should be resorted to before surgical measures are undertaken; in many cases the cause for this non-healing can be ascertained.

There is an important group of cases which have been allowed to heal prematurely and which have a reaccumulation of the pus either at the site of the former empyema, or in a new location. It may be within the substance of the lung. In these cases the pleura is greatly thickened, sometimes to over an inch, which renders an exact differentiation of these conditions extremely difficult.

A number of patients have been observed who, after the healing of the thoracotomy wound, have a persistent pneumothorax enclosed within a dense fibrous wall. Such cavities occasionally become filled with an exudate, the discovery of which is rendered difficult because the density of the fluid content is similar to that of the thickened pleura. Repeated roentgen examinations become necessary, and aspiration must be resorted to for the diagnosis. Pleural effusions, no matter how small, seldom remain stationary; even in old cases they usually increase slowly, so that there is a steady change in the contour of the shadows. On the other hand, pleuritic thickenings alone



have a tendency toward slow but progressive diminution. If the case has been under observation before the reaccumulation has occurred, comparison with previous roentgenograms may assist in arriving at a diagnosis.

Special attention should be paid to the site of the old sinus tracts, which are particularly favored locations for reaccumulations of fluid.

Similar difficulties are encountered in the roentgen-ray examinations of cases which have never been operated on and which have been treated merely by aspiration.

In general, it may be stated that the shadow of pleuritic thickening alone is rather more clear-cut in detail than when fluid is present, as the latter produces a certain amount of haziness.

Unless there is a specific contra-indication, all draining cases should be examined from time to time roentgenographically. It is preferable that this examination should be complete, i. e., by fluoroscopy and by stereoroentgenography. If the information obtained is not satisfactory, the examination is repeated by the same methods after injecting into the cavity a solution of paste containing a substance opaque to the roentgen-ray. Pastes, when properly warmed, can be readily injected into the cavities.

Fluoroscopic examinations can be readily made, with the patient in any position, without the risk of an escape of the injected mass. A clear detail of the sinus as well as of the cavity is thus obtained.

The objections to the use of bismuth pastes may be classified as follows:

- (1) The danger of poisoning by absorption.

- (2) The danger of reïnfecting a sterile cavity. (There is no valid reason why bismuth pastes cannot be sterilized, and when injected with proper aseptic precautions, the danger of reïnfection of the cavity is negligible.)

- (3) The difficulty of removal. (This is no doubt one of the principal disadvantages of pastes. In a measure it can be overcome by washing out the cavity with warm sweet oil).

- (4) The possibility of the paste obstructing the tube and interfering with drainage.

As the use of bismuth paste has been found to be objectionable in large cavities, other substances may be used. The most satisfactory substance, and the one now generally used, is a 15 per cent neu-

tral solution of thorium nitrate. It is quite expensive, especially when used in quantities sufficient to fill large cavities, but it is much less irritating than the iodids, although in 2 cases a rather severe hemorrhage followed its use. It has the advantage of being a clear watery solution, which can be readily washed out, and does not in any way interfere with drainage, or with the continuance of the Carrel-Dakin treatment. However, any injection into large cavities should be avoided, if possible.

In complicated cavities of considerable size the patient is placed on the table in such a position that the opening into the chest is uppermost. The requisite amount of thorium solution is now slowly injected with a blunt-pointed glass syringe of about 30 c. c. capacity. The patient should be warned not to make any unusual respiratory effort, as quiet and shallow breathing gives the best results, permitting a perfect filling of the cavity.

In the use of watery solutions, some difficulty arises from the fact that it is not easy to close the opening in such a manner that the fluid does not escape when the patient is placed in a proper position for the roentgen-ray examination. The author had found that the best plan is to plug the opening firmly with a generous piece of sterile gauze packing, covered with a piece of rubber dam; this dam is firmly strapped down with wide adhesion strips at its edges, and a lead marker attached to an adhesive strip is placed over the wound.

Even with these precautions, there is always some escape of fluid, so that fluoroscopy after the plates are made is often unsatisfactory, as leakage produces adventitious shadows.

When dealing with small cavities or sinuses, the same technic is employed, except that the sterilized bismuth paste is substituted for the thorium solution.

If a bronchial fistula is suspected, the injection must be made very slowly, frequent inquiries being made of the patient as to whether or not he feels like coughing, or tastes the injected material. An attack of coughing, while not harmful, may clear the bronchi of the paste, and the very detail which the examiner is desirous of obtaining may be lost. After the completion of the examination, the patients should immediately be sent to the surgeon for proper dressing.

A 20 per cent solution of subcarbonate of bismuth in sweet oil, or liquid albolene, has been found to be very satisfactory for outlining cavities of moderate size, especially those with small external open-

ings. Retention of bismuth injections renders the patient liable to poisoning. This occurred in one case in which a 20 per cent solution of bismuth subcarbonate in sweet oil was used.

Eggers (*Surgery, Gynecology and Obstetrics*, April, 1919) analyzed 70 cases of empyema at the Base Hospital at Camp Jackson and concluded that the *x*-ray has proved of great value in diagnosis, particularly in the encapsulated varieties of empyema; at times all physical signs fail and examiners who do much of this work know how deceptive the signs may be. It is probably not putting it too strongly to state that fluid in the chest may produce the exact physical signs of a pneumonia, and *vice versa*.

P. E. Weil and Loiseleur (Roentgen Exploration of Effusions in Serous Membranes. *La Presse médicale*, Paris, Dec. 3, 1917, xxv, No 67, p. 683) inject air into a joint or into the pleura, pericardium, vaginalis or peritoneum, after evacuation of an effusion, and are thus able, by the distention of the parts, to show the details in the joints. In tuberculous pleurisy and pericarditis, the injection of air into the place of the effusion has a direct therapeutic action, besides rendering roentgenoscopy possible and distinct. In one case of tuberculous seropurulent and hemorrhagic pericarditis, the patient has been clinically cured for eight months since 8 applications of paracentesis and insufflations of air were given. When the effusion recurs, the presence of the air forces it down into the lower part of the lung, where it is most readily accessible to puncture. The authors inject air equal in amount to that of the effusion withdrawn.

E. G. Beck (The Empyema Problem. *Surgery, Gynecology and Obstetrics*, April, 1919, xxviii, 379) states that as soon as a stereoroentgenogram of the chest shows an abnormal condition, the following conditions are to be differentiated:

(1) *Unresolved Pneumonia*.—The shadow is constant, corresponding to the position of the lobes.

(2) *Bronchopneumonia*.—The shadows of the bronchopneumonic patches are small, and more or less circumscribed, causing a mottling of the pulmonic fields. These shadows sometimes merge into one another, due to a confluence of the foci.

(3) *Fluid in the Pleura, Serous or Purulent*.—When the pleural cavity is entirely filled with fluid, the lung is compressed toward the hilus. If no adhesions are present, it retracts upward and pos-



teriorly. The roentgenogram of this condition will present a shadow resembling ground glass, nearly equal in density throughout the entire area occupied by the fluid. This, however, is true only when the patient is on his back while under the roentgen examination, inasmuch as the fluid gravitates and covers the entire posterior area of the pleural cavity. In cases in which the quantity of fluid is not large and the roentgenogram is made with the patient in the standing or sitting posture, a characteristic appearance will be noted: the fluid will gravitate into the lowest part of the pleura and produce a dense shadow reaching to its upper margin; above that there will be a distinct pneumothorax. Another roentgenogram made with the patient in the lateral position, namely lying on the affected side, will show a shadow corresponding to the level of the fluid along the outer part of the chest, and a pneumothorax between the margin of the retracted lung and the level of the gravitating fluid. If the same patient is turned over on the unaffected side, the fluid will gravitate toward the middle line and leave a pneumothorax externally.

(4) *Lung Abscesses*.—The diagnosis of a lung abscess is more difficult. A patient may have had an encapsulated pocket of pus in his lung for months and even years before a diagnosis is made. Its location by physical examination is more difficult because it is usually centrally located and, as a rule, much smaller than an empyema. The tuberculous abscess has a distinct wall and is more often multiple and, therefore, much more easily diagnosed than one resulting from a pneumonia or from other causes. When a patient gives a history of having suddenly spit up a quantity of pus, and continues to expectorate purulent material, the presence of a lung abscess must be considered. After an abscess has ruptured into a bronchus, its localization becomes more difficult still, because the sac has collapsed, and a probatory puncture will in most instances fail to reach the pus cavity.

(5) *Pneumothorax*.—There should be no difficulty in diagnosing a pneumothorax, as the physical signs are very characteristic, especially the hyperresonance. The roentgenogram, however, is most convincing. We note here the absence of shadows in a well-defined area. This indicates that the lung has retracted and that the space is not occupied by fluid but air, which, of course, produces no shadow whatever.

(6) *Acute Pulmonary Tuberculosis*.—This condition in con-



junction with abscess will, in the roentgenogram, closely resemble bronchopneumonia, showing areas of infiltration of varying extent. Thus the history and clinical findings must assist in the diagnosis. The healed tuberculous process, however, gives a characteristic picture, namely, an apparently transparent lung with fine linear markings, corresponding to the bronchi, with many small, distinctly-outlined shadows of calcified deposits, and many concrete shadows resembling snowflakes, which represent fine scars remaining from a healed tuberculosis.

## B. DISEASES OF THE HEART

G. Hammer (The Roentgenological Methods of Determining the Size of the Heart [Die röntgenologischen Methoden der Herzgrossebestimmung]. *Münchener medizinische Wochenschrift*, 1918, lxxv, No. 4) points out that various percussion methods for determining the size of the heart are frequently insufficient (as in emphysema, in fat persons, in great enlargement of the heart, etc.). The possible roentgenological methods are:

(1) Exposure to the roentgen-rays at a distance (teleroentgenography).

(2) The orthodiagraphic methods.

These methods give us only an outline, a silhouette of the heart, and not the special dimensions of the organ. But the outline obtained permits us to draw conclusions concerning the dimensions of an enlarged heart. For determining the outline of the heart only three lines are important: the distance from the median line on the left, the distance from the median line on the right, and the longitudinal diameter of the heart. Among the methods of determining the outline of the heart, the author believes that the orthodiagram takes first place. Numerous experiments have shown that the values obtained by roentgenography at a distance were, on an average, 1 cm. greater than the corresponding values shown on the orthodiagram.

G. W. Grier (*X-ray Examination of the Heart and Great Vessels. Interstate Medical Journal*, March, 1919, xxvi, No. 3, p. 168) classifies the information obtained by roentgen-ray examination of the heart into two classes: (1) facts regarding size, contour and lo-

eration of the heart; (2) facts regarding the pulsations and the influence of respiratory movements on the heart.

In considering the size of the heart, there are three possibilities: that it is too small, that it is normal, or that it is too large. The undersized heart is not often seen; the author mentions only 2 cases, and both of these showed marked clinical evidence of cardiac weakness.

The normal heart varies in size between rather wide limits. For descriptive purposes the author divides the normal heart into three classes: (1) the small vertical (drop) heart of the asthenic individual; (2) the medium-sized and obliquely-placed heart of the sthenic individual; (3) the large transversely-placed heart of the hypersthenic.

The small vertical heart lies with its long axis parallel to the long axis of the body. It is found in long-chested, thin individuals, and is supposed to indicate a predisposition to pulmonary tuberculosis. Its vertical position is probably due to the unusual length of the chest, just as the transverse heart in a fat person is due to the size of the chest. Deep inspiration has a tendency to convert the vertical heart into one of the oblique varieties, while deep expiration tends to convert the oblique heart into the vertical type.

The medium-sized heart varies considerably in size, shape and obliquity. The right ventricle is not seen in a roentgenogram, being covered by the diaphragm. The right auricle projects about 1 inch to the right of the spine. It describes a decided curve, and blends above with the aorta and vena cava, and below with the diaphragm. The left ventricle forms the greater part of the shadow seen to the left of the spine. Above this shadow of the left ventricle is a small bulge representing the left auricle. Above this is another bulge indicating the pulmonary artery, while still higher one sees the descending aorta and aortic arch.

The large transverse heart rests with its long axis almost at right angles to the long axis of the body, this position resulting from a short chest and high diaphragm.

Heart-shadows which appear too large are due either to hypertrophy and dilatation of the heart or to pericardial effusion.

The dilated heart may be enlarged in any or all of its chambers. Enlargement of the right side of the heart-shadow only indicates a dilation of the right auricle, and occurs in the tricuspid lesion. An

enlarged left shadow occurs in mitral and aortic lesions. In mitral lesions of long standing, followed by decompensation, the entire heart is dilated, while in early cases of mitral lesions the left auricle only is affected.

Pericardial effusion causes an increase in the size of the heart-shadow with obliteration of the normal curves identifying the various heart-chambers. The heart-shadow becomes roughly triangular, with the apex above and the base below.

The heart may be displaced for various reasons, such as pleurisy with effusion, fibroid phthisis, tumors in the mediastinum, and sub-phrenic abscess. Fluoroscopic examination is an important aid in differentiating these conditions.

Aneurysm of the ascending aorta without involvement of the arch is occasionally seen as a sacculated protrusion of the right border. Large aneurysms of the arch are always continued into the ascending and descending aorta. The differentiation between mediastinal tumor and aneurysm is very difficult at times, especially when the aortic pulsations are transmitted through a solid mass and give the impression of an expansile tumor. An important differential point is the fact that the borders of an aneurysm are always smooth and convex, while most solid tumors are irregular and knobby. Also, in aneurysm the tumor can be seen, upon rotating the patient, to be continuous with the aorta, while enlarged glands usually lie behind the shadow of the spine.

The differential diagnosis of involvement of the thymus, or sub-sternal thyroid, is easier, as the tumor lies above the arch. These conditions might be mistaken for an aneurysm of the innominate artery, but here again the position is an important aid in differential diagnosis. The thymus lies in the midline, while the innominate aneurysm lies to the right of the sternum; also, the borders of the thymus are more apt to be concave or straight than bulging, as seen in aneurysm.

Bordet (Methods of Estimating Augmentation in Depth of Volume of Left Ventricle. *Lancet*, Nov. 30, 1918, p. 750) points out that anterior or posterior views of the cardiac shadow show the size of the heart only in a longitudinal and transverse direction and not in the anteroposterior direction. Considering that the left ventricle occupies only a narrow strip of the left margin, and that it is situated almost entirely on the posterior aspect of the organ, the con-

clusion is that this cavity develops in depth when it becomes increased in volume.

To observe the increase in this direction, Bordet and Vaquez use the following methods:

(1) Estimation of the angle of the disappearance of the apex of the heart in the right posterior oblique position. An individual who is to be examined fluoroscopically should be placed in the dorsal position; if the body is made to describe a rotatory movement from right to left the pictures of the heart and the vertebral column travel in an inverse direction. The former is displaced toward the right, the latter toward the left, and a moment arrives when the external profile of the apical zone becomes level with the spinal shadow before disappearing. The angle at which the shadow of the apical zone disappears increases with the extent of the globular condition of the apex of the heart and its development in depth. To calculate this angle a goniometer is used, which shows the degree of obliqueness of the biscapular line with the margin of the screen. Multiple observations have led the author to the conclusion that the angle of disappearance in normal individuals is from 25 to 30 degrees. An angle beyond 30 degrees justifies the conclusion that there is an augmentation of the ventricular volume.

(2) Ascertaining the index of depth. This method does not require the use of any special measuring apparatus. The patient is placed for examination in the direct anterior position, the region of the sternum being in contact with the screen. The normal projection of the apical zone of the heart and its deformation by an oblique ray resulting from the lateral displacement of the tube over a fixed distance are marked off successively. This is a method well known to roentgenologists for the locating of foreign bodies. The conditions necessary for the experiment are obtained by a fixed screen placed at a certain distance from the tube. The greater the depth of the ventricular development the sooner will the oblique ray meet the posterior contour of the heart, and the further from the normal point will its projection be. The distance between the two points of projection, marked on the screen with pencil, is the index of depth. It varies among normal adults from 7 to 14 mm., the screen being 60 cm. from the focus, and the displacement of the tube being 10 cm. Beyond 14 mm. the development of the depth of the left ventricle



is exaggerated. In cases of acute hypertrophy it reaches 20,25, or 30 mm.

These two methods give analogous indications, and one, at least, should be used in a volumetric examination of the heart.

Constantin, Vigot and Goeselin (Immobility of the Cardiopericardial Shadow Considered as a Pathognomonic Sign of a Lesion of the Heart. *Journal de radiologie et d'électrologie*, Paris, Feb. 1918) state that the signs of wounds of the heart are of great variety, thus explaining the numerous errors of diagnosis and tardy or useless interventions. Fluoroscopy is of the utmost help in determining the necessity of intervention. The authors had under observation 3 cases of wounds of the heart (by small pieces of shell), complicated by hemopericardium, the effusion of blood being demonstrated by fluoroscopic examination.

The fluoroscopic signs of pericardial effusions are:

- (1) Augmentation of all diameters of the shadow of the heart.
- (2) Changes in the outline of this shadow.
- (3) A more or less complete disappearance of the rhythmic movements.

In cases of serious or purulent pericardial effusion the outline of the shadow of the heart is usually vibratory. The increase of the shadow may be due to a cardiac enlargement and is not a pathognomonic sign. The deformation of the outline of the shadow of the heart, which is ordinarily valuable, is not as important in this connection, inasmuch as a wound of the lung may blur and change this outline.

The immobility of the outline of the shadow of the heart is a sign of first importance. In 2 of the cases observed by the authors, the immobility was absolute, giving the impression that "the heart had ceased beating." In the third case, there was a very slight undulation of the left border of the shadow, at the level of the left ventricle.

(To be continued)

BROWN, G. E.: Syphilitic Aortitis and its Early Recognition. *American Journal of the Medical Sciences*, Jan., 1919, clvii, p. 41.

The article deals with a single and early type of syphilitic aortitis, that confined to the first portion of the aorta. The author believes that syphilitic aortic incompetency and the aneurysmal types are already familiar and can be readily diagnosed, but that this early type is easily missed, and offers the best chance of effective therapy.

Roentgen diagnosis is the most satisfactory method of demonstrating changes in the aortic arch. The technic advised is the 6 or 7 foot plate, and fluoroscopy. The normal aortic measures are given as from 5 to 7 cm. transverse diameter for young male adults, and 8 cm. for males of fifty years. These measurements are both slightly less in women. Changes demonstratable by the roentgen-ray are:

- (1) Enlargement to the right. This is normally the earliest visible change.
- (2) Enlargement to the left with obliteration of the normal aortic knob.
- (3) Enlargement to right and left.
- (4) Increased density of the aortic shadow.
- (5) Reduction of aortic pulsation as seen by the fluoroscope.

In addition, percussion and the Wassermann test should be employed routinely in every case. An especial stimulus to diagnosis of these early cases is the difficulty of differentiating them from incipient tuberculosis. Slight, irregular fever, chest pains indefinite in type and often diagnosed as pleuritis, hoarseness, dry cough, dyspnea, sense of fatigue, all form a symptom-group which may easily be misinterpreted.

I. S. HIRSCH.

## SECTION ON NEUROLOGY AND PSYCHIATRY

KREISCH, H.: The Psychic Phenomena in Eunuchoids (Die psychischen Erscheinungen der Eunuchoiden). *Zeitschrift für die gesamte Neurologie und Psychiatrie*, 1919, xlv, 136.

The author calls attention to the fact that too little attention has hitherto been paid to the lighter psychic deviations in eunuchoids, a rather remarkable circumstance in view of the attention given to the psychic significance of the absence of the sex gland hormones. Interest attaches to the position which eunuchoids occupy in reference to infantilism, inasmuch as it is possible that some light on the etiology of the disease may be gained by researches in this direction. Another question of importance is whether or not other separate endocrine glands are responsible for definite symptoms, such as, for example, the epileptic symptoms. On the basis of his study of the subject the author is of the opinion that in the psychic as well as in the physical sphere eunuchoidism can be definitely differentiated from infantilism. Eunuchoids may be divided into three groups. The first group includes those with normal intelligence, with frequent epileptic phenomena, and with numerous peculiarities in the vasomotor region. The second group embraces all degrees of weak-mindedness; the slighter degrees are to be especially looked for. The third group includes cases with pronounced epileptic phenomena, and among these, naturally, are extreme degrees of feeble-mindedness. It is to be expected that with a more complete knowledge of the disease picture other degenerative psychotic phenomena will be discovered. The symptoms of the first group seem to present some resemblance to those found in castrates. The etiological factor of the epileptic phenomena probably lies in the vasomotor disturbances. Eunuchoidism is doubtless a disease picture of constitutional degen-

eration. In the foreground is the disturbance of the testicles, but other inner secretory glands are also involved, for example, the thyroid and hypophysis. Concerning the epileptic phenomena, it may be said with certainty that they stand in no etiological relationship with the secretions of the testicles. Such a connection is disproved by the fact that these phenomena are not frequently observed in castrates; nor do they play any considerable rôle in late eunuchoidism, and finally, even in the disease picture to which the author has reference in the present article, they are far from frequent. But, on the other hand, there may be a relation between the epileptic phenomena and the changes in the thyroid gland. It is well known that in recent years some of the epileptic diseases have been brought into connection with disturbances of this gland, and it may also be regarded as an established fact that a hypofunctioning of the thyroid is a factor in eunuchoidism. The author, however, was never convinced of an absolute etiological connection of this sort. The statement of Stern that a eunuchoid epileptic was favorably influenced by treatment with thyroid gland preparation may be considered as evidence in this direction, but ostensibly therapeutic results with epilepsy must be accepted with caution. In recent years the author has made efforts to discover eunuchoid traits in epileptics, but without success.

S. E. JELLIFFE.

WIMMER, A.: Non-syphilitic Mental Diseases in Syphilitics. *Zeitschrift für die gesammte Neurologie und Psychiatrie*, 1918, xlii, 290.

Where there are no pronounced neurological symptoms directly traceable to the syphilitic infection (as dementia paralytica, etc.), it is very difficult to determine whether or not an ordinary "syphilitic psychosis" is caused by the syphilis itself. The author suggests the following criteria as helpful in establishing the causal relation between the psychosis and the syphilis:

- (1) Positive proof of the infection (by the anamnesis, etc.).
- (2) The concurrence of the symptoms of the psychosis with established syphilitic symptoms of nervous or non-nervous character.



(3) Parallel variation of the psychic symptoms with the organic signs known to be of syphilitic origin.

(4) The positive Wassermann.

In general, when all four of these criteria are present in a case, it will most probably be found that the mental disease picture is of the exogenous type, i. e. confusion, disorientation, the *délire onirique hallucinatoire*, as in other infections, intoxications, and auto-intoxications. It may be assumed to be due to the basic organic disease. On the other hand, if the mental disease picture is of endogenous form (of manic depressive or paranoid hallucinatory type), it should not be assumed without further proof to be due to the syphilis. The author describes 11 cases to illustrate the relation of psychoses to syphilis. In only one so-called simple "syphilitic psychosis" could the psychic and neurologic picture be regarded as wholly due to the syphilitic infection, and this psychosis was of the exogenous reaction type. In the remaining cases, according to the author's opinion, the psychoses were either non-syphilitic (although some of the organic signs of syphilis were present), or represented an intermingling of the disturbances due to syphilis and those caused by some other disease. Among these forms were hysterias, one case of situation psychosis, an acute hallucinosis, with anxiety, which was interpreted to be of psychogenic origin, because fourteen years before the patient had suffered from a similar attack, several cases of the manic-depressive type combined with syphilis, one case of irritable paranoid psychopathy without neurological symptoms, but with extreme changes in the spinal fluid. In this case the syphilitic infection was clearly not responsible for the form of mental disease, and the instance illustrates the diagnostic problems to which combinations of syphilis and psychoses may give rise. Without underestimating the value of the serological and cytological findings in making the diagnosis of syphilis, the author holds that where a diagnosis of mental disease is to be made in a syphilitic, a certain scepticism on the ground of positive clinical evidence should be maintained as to the diagnostic infallibility of these signs for determining the etiology of the mental affection.

S. E. JELLIFFE.

REICHMANN: Concerning the Treatment of Hysterical Seizures. *Neurologisches Centralblatt*, May 1, 1919, xxxviii, No. 7, p. 298.

It has been amply demonstrated, during and by the war, that the German people have a stronger tendency to hysteria than was previously supposed; also that the signs which have hitherto been conclusively considered as characteristic of hysteria as differentiated from epilepsy, cannot always be relied upon. The author suggests tests which permit the true character of the disease to be recognized. The patients are asked, when in their normal condition, what caused their attack. They are then placed in an hypnotic state and the same question is put to them, after it has been forcefully suggested that they shall remember the exact condition of their former seizure. The patients are then again placed in the situation of the first attack, and if the attack again occurs the hysterical reaction may be overcome, with consequent recovery. An epileptic seizure cannot be produced by suggestion, and if, after attempts by various physicians, it is found impossible to reproduce the attack, it may be assumed that the affection is epileptic.

S. E. JELLIFFE.

HOFFMAN, J.: Symptoms of Lateral Pyramidal Tract in Hereditary Friedreich's Ataxia. Postmortem Results. *Deutsche Zeitschrift für Nervenheilkunde*, 1918, lx, 179.

Two cases published by Schönborn in 1900 (*Deutsche Ztschr. f. Nervenheilk.*, xviii) presented the picture of Friedreich's ataxia on the whole, with the exception, however, that the tendon reflexes were not extinguished, but were increased in part up to clonus. Schönborn had, therefore, tentatively placed the case between Friedreich and cerebellar heredo-ataxia [P. Marie]. At autopsy in one of the cases the typical picture of Friedreich's ataxia [combined cord affection of the spinal cord in addition to smallness of the oblongate and bridge] was obtained without there being any involvement of the cerebellum. To have designated these cases as intermediate stages would have been accordingly incorrect. On the other hand, there is no reason for ascribing a special entity within the disease to cases of typical

Friedreich's ataxia, which by exception have not lost the tendon reflex. The author cites a number of cases in which this has occurred. For a constant affection of the lateral pyramidal tracts is a typical anatomical finding, which may also be recognized by Babinski signs. Other well characterized familiar degenerative diseases present similar deviations in single cases.

S. E. JELLIFFE.

KLEIST, K.: Concerning the Conception of Subcortical Motor Disturbances (Chorea, Athetosis, Motor Impairment, Rigidity, Tremor). *Archiv für Psychiatrie und Nervengrankheiten*, 1919, lxi, 790.

The author undertakes to give a comprehensive explanation of subcortical motor disturbances. While assenting to the theory of the extrapyramidal localization of choreatic disturbances and to their character as arising from removal of inhibitions (instead of being due to a direct stimulation, as Bonhoeffer believes), he suggests some modifications. There seems but one way to unite all the facts known of the pathology of chorea in a consistent theory, namely, to assume that the inhibition, the removal of which causes the choreatic movements to set in, is derived from the cerebellum. To attribute to the cerebellum an inhibitory, in addition to a coördinating and tonus-preserving agency, seems at first an unusual view, as other symptoms from the cerebellum, ataxia and hypotonia, are just the opposite of those which would result from removal of inhibition. According to the current view, the stimuli proceeding from the cerebellum go to the mesocephalon, mesencephalon, and the cerebrum, as organs of higher order. A disturbance of these stimuli, then, according to this view, would cause defect of regulation in these higher organs, but no increase in the separate activities as result of the falling away of inhibitions. If, however, the central nervous system is looked upon, not from the point of view of the cerebrum cortex, but from the point of view of the cerebellum, then the mesocephalon, the mesencephalon, the corpus stratum, and, in a sense, the cerebrum, seem to be dependent parts whose specific performances, freed from the inhibitory influence of the cerebellum, could be exaggerated. There is no essential difference between regulatory and inhibitory func-

tions; tremor, especially intention tremor, which often makes its appearance as a result of injuries of the cerebellum and of its superior peduncles, is regarded as a disturbance of coördination connected by transitional steps with ataxia. According to the author's view, the movements of chorea and athetosis result from injuries to the cerebellum (nucleus dentatus), to the superior peduncles, to the nucleus tegmenti, to the thalamus, perhaps to the globus pallidus, to the putamen, and to the nucleus caudatus. These movements are, therefore, all connected with a continuous afferent path of conduction and its central termination. By this path regulatory and inhibitory influences are conducted to the corpus striatum and the globus pallidus as the motor element of the striatum. When these paths are interfered with, the result is incoördinated automatic movements, decomposition of the movements into more elementary forms, and over-stimulation of accessory movements. The character of the resulting disturbances depend on the anatomic localization of the affection. For example, subcortical motor paralysis and rigidity is connected with affections of the thalamus. The author is of the opinion that contradictions in the nature of disturbances (paralysis or over-stimulation) apparently arising from the same site will be explained by a better understanding of the localization of the pathological process and of the significance of areas destroyed.

S. E. JELLIFFE.

SPILLER, W. G.: The Oculopupillary Fibers of the Sympathetic System: Division of the First Thoracic Root in Man. *The American Journal of the Medical Sciences*, March, 1920, clix, No. 3, p. 325.

The author's study of the oculopupillary fibers of the sympathetic system led him to investigate the relation of these fibers to the higher parts of the brain. A case is reported of a boy aged 11, with a history of convulsions, weak left extremities, and backwardness at school. He had left hemiplegia (duration not stated), exaggerated left tendon jerks, and Babinski reflex on the left side. The left pupil was smaller than the right, and the left palpebral fissure was the smaller. Ocular movements were normal. The tongue protruded and deviated to the left. There was some atrophy of the left limbs. Evidently



a paralysis of the cervical sympathetic existed on the side of a long-standing hemiplegia shown by the eye signs. The lesion must have been above the lower cerebral peduncles, or some cranial nerve would probably have been involved.

Karplus and Kreidl experimented on about 20 cats' brains and found that electrical irritation just behind the optic tract near the oculomotor nerve caused dilatation of both pupils and expansion of both palpebral fissures. The irritation was conveyed through the cervical spinal cord, demonstrated by exposing the cervical sympathetic on each side and irritating the named area of the base of the brain. If the heterolateral cervical sympathetic was cut, irritation promptly dilated the homolateral eye. If, then, the homolateral cervical sympathetic was divided, the pupil of the homolateral side was not influenced. Electrical irritation of the dura, the cerebral hemispheres, the peduncles or the infundibulum was without this effect. The same results as before were produced when the intracranial portions of the trigeminal and oculomotor nerves and the optic tract were cut. Removal of the cerebral hemisphere, even complete separation of all parts of the cerebrum from this irritated area, so that only a little of the cerebrum remained with the brain-stem, did not disturb the effect of the irritation. They concluded that irritation of the base is transmitted through the homolateral cerebral peduncle cord, predominatingly in the heterolateral side, and then runs through both cervical sympathetic cords to the eyes. The irritable zone at the base was found in the hypothalamus near the dorsomedial portion of the foot of the cerebral peduncle, in the frontal part of the corpus subthalamicum.

In another paper Karplus and Kreidl concluded that each half of the cervical cord conducts impulses from the brain-stem to both cervical sympathetic cords. Decussation does not occur in the cervical spinal cord, but below the cervical cord. Spiller believes that in man the decussation of the fibers is not in or below the cervical spinal cord, because in 2 cases of tubercle of the pons, which destroyed the axis-cylinders, the oculopupillary symptoms were on the side of the lesion. Cases of oculopupillary paralysis of the sympathetic on the side of the lesion have resulted from occlusion of the posterior inferior cerebellar artery. In another case a tubercle was in the left side of the pons, the tumor extending into the lower part of the cerebral peduncle. The left pupil was 2 mm. and the right,

3 mm. Both pupils reacted to light, accommodation and convergence. The point of exit of the oculopupillary fibers from the spinal cord has been established; these fibers leave principally by the first thoracic root, and possibly by the eighth cervical and second thoracic roots, probably by the anterior divisions of the roots. As far as the author knows his case is the first recorded in literature.

A second patient, aged 18, had a tumor removed, October, 1919, from the left side of the spinal cord in the region of the first thoracic nerve. To remove the tumor it was necessary to divide the large root near its end through the dura, and both anterior and posterior portions were cut. Following the operation the left palpebral fissure was distinctly smaller than the right and the left pupil was smaller. Both reacted promptly to light and convergence and the left eyeball was not quite so prominent. Swelling occurred on the right side of the face the next few days, while the left side remained dry. Sweating also occurred freely on both sides of the chest. The right side of the face was very flushed. Numbness was experienced in the left little finger, the ulnar side of the ring finger and the ulnar side of the left forearm. The resulting palsy of the sympathetic to the eye was pronounced from the cutting of this one root, and this root evidently contained most of the sympathetic fibers to the eye. The palsy of the cervical sympathetic had not changed when the patient left the hospital, November, 1919. The middle of the next month the right pupil measured 4.5 mm. and the left 3.5 mm. The width of the right palpebral fissure was 11 mm. and that of the left, 19 mm. Two installations of a 4 per cent cocaine solution were made in the left eye with a resulting well-marked dilatation of the pupil so that there could not have been a complete sympathetic paralysis from division of the first thoracic root. This would indicate that the first thoracic root is not the only root conveying oculopupillary fibers, even though it may convey most of them. Cocaine is believed to stimulate the sympathetic fibers of the iris.

A. T. MAYS.

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## SECTION ON GENERAL MEDICINE

VOEGTLIN, C.: Recent Work on Pellagra. *Public Health Reports*.  
June 18, 1920, xxxv, No. 25, pp. 1435-1452.

Pellagra was discovered in 1735 by Casal, who described its triad of symptoms as cutaneous, digestive and nervous. The cutaneous symptoms consist of a bilateral erythema appearing rather suddenly on exposed surfaces and followed by desquamation. The digestive symptoms consist of stomatitis, constipation and diarrhea. The nervous symptoms consist of changes in the reflexes and in sensation, tremors, psychic abnormalities, and sometimes convulsions. The diagnosis depends upon the skin lesions.

Numerous theories of its etiology have been advanced. Marzari, over a hundred years ago, advanced the theory that pellagra was due to a more or less exclusive diet of corn. Later other Italian workers considered that it was due to "spoiled" corn. Later other workers claimed that pellagra was due to a specific organism. None of these theories has been proved.

Pellagra has a limited geographical distribution. It is endemic in Spain, Italy, France, the Balkans, lower Egypt, the West Indies and the United States. Sporadic cases have been reported from Great Britain, Canada, South Africa and India. It was recognized as endemic in the United States in 1908, and was immediately studied by the United States Public Health Service. Up to 1912, 30,000 cases had occurred with a mortality of 40 per cent. An extensive study of the transmissibility of the disease to monkeys was

carried out by Lavinder and Francis in 1917 with negative results. In 1913 an investigation of the relation between diet and pellagra was undertaken by the author. The value of a mixed diet containing fresh milk, meat and eggs, has been pointed out by many physicians both earlier and in recent times. "The value of the dietary treatment was, therefore, well established and almost universally accepted even by adherents of the infectious and 'spoiled-corn' theories. This was a most significant fact which gained in importance when it was brought into relation with the characteristics of the diet consumed by persons prior to their attack of pellagra. The striking features of this diet appeared to be its lack in certain foods, such as milk, meat, and eggs, the same foods which proved to be so beneficial in the treatment of the disease."

Valuable information on this point was obtained from the work of Roussel, Lombroso, and especially from Wassow and Grindley of the Illinois Pellagra Commission. The commission discredited any causal relation between corn and pellagra. They regarded the deficiency of the diet in animal protein as being only a predisposing cause, rendering the body less resistant to the infecting organisms.

The author, however, from a study of their work and other available information, was led to believe that there was a causal relation between diet and pellagra. This belief was strengthened by the work of Atwater and Laugworthy, which showed that in the South, where pellagra is endemic, the poorer people live largely on a vegetable diet, with cereals and pork fat, while people of the same class in the North, where the disease is rare, use a mixed diet, including fresh meat, milk, and eggs. Moreover, in France, pellagra disappeared with improved dietary conditions. The author considered three possibilities to explain the nature of the defect of a restricted vegetable diet: (1) A deficiency of certain vitamins; (2) the presence of some toxic substance; and (3) a deficiency in certain amino acids.

Feeding experiments with laboratory animals showed that they could not subsist on a strict vegetable and cereal diet, and symptoms referable to the digestive and nervous system developed. The addition of milk and eggs to the diet restored the animals to normal.

In 1914 the Public Health Service established a hospital at Spartansburg, S. C., to study the well-defined and uncomplicated cases of pellagra, the abnormalities of the metabolism, the compara-

tive value of a mixed and a restricted vegetable diet in treatment, and the therapeutic value of extracts made from foods supposedly rich in "vitamins".

A careful study of the metabolism of pellagra patients showed that the utilization of food was normal except in cases with an intense diarrhea. The digestive secretions were somewhat disturbed in many cases. A large number suffer from an acidity and lack of pepsin. This often persists for a long time after recovery has apparently taken place.

Intestinal putrefaction is increased. The blood shows no striking abnormalities. A mild secondary anemia may be present. As pellagra sometimes occurs in breast-fed infants, a study of the human milk was made. So far as its chemical constituents were concerned, there was not enough deviation from the normal to account for the disease in nursing infants. A study of the vitamin content by animal-feeding experiments should be made.

The influence of diet as metabolism was made by studying groups of cases. One group on admission to the hospital was put under the best hygienic conditions, and was given a diet, liberal in variety and sufficient in quantity, but with a low protein and high carbohydrate content, similar to the diet in general use in the vicinity. On this diet the patients' conditions remained about the same or became gradually worse. After some time, the diet was changed by the addition of milk, fresh eggs and meat, with the result that there was a gradual improvement and in some cases a complete disappearance of all symptoms.

Another group of patients, which was placed on this mixed diet immediately on admission to the hospital, began to show definite improvement within two weeks with apparent recovery in about two months, in most cases. A small number of far-advanced cases did not improve under the same dietary treatment.

In an attempt to discuss the reason for the therapeutic action of animal foods, groups of patients were kept on the restricted vegetable diet under close observation until the disease seemed stationary or advancing a little. Then a fat-free alcoholic extract of yeast, of rice polishings, of ox liver, or of thymus gland was administered daily; the extract of yeast and of rice polishings have a high content of antineuritic vitamin, but no antiscorbutic or fat soluble vitamin. It was assumed that the extracts from liver and thymus con-

tained both. The results, while not conclusive, were suggestive. The yeast and rice extracts failed to modify the course of the disease. This indicates that the defect in the diet, is not due to a deficiency in antineuritic vitamin. The liver extract was followed by an improvement comparable to that produced by a diet containing fresh animal protein.

The correctness of the dietary theory must, in part, be based on the prevention of the disease by a proper diet. This has been shown to be the case in other diseases of dietary origin. Beriberi can be prevented by food rich in antineuritic vitamin; scurvy by vegetables, fresh meat or certain fresh fruits; xerophthalmia by food containing fat-soluble vitamin.

Goldberger, Waring, and Willets, by work in institutions, in which a large number of cases of pellagra had occurred each year for some time, proved very conclusively that pellagra could be prevented by an appropriate change in diet.

Previous attempts at producing pellagra in animals had been unconvincing. In 1914 the author began feeding experimental animals with the hope of reproducing the disease in them. The restricted vegetable diet was insufficient to maintain life over a long period. The animals developed constipation, diarrhea, changes in reflex irritability and convulsions. In two monkeys the tongue showed a denuded and red appearance such as is seen in pellagra, and the dorsal surface of the feet showed a wet dermatitis. A characteristic pellagrous dermatitis was never observed.

A pathological study of the tissue showed lesion similar to those observed in pellagrins: (*a*) widespread passive congestion; (*b*) retrogressive changes—cloudy swelling, hydropic degeneration, fatty infiltration, hyalin and ameboid degeneration of the thoracic and abdominal viscera, congestion, hemorrhage and ulceration of the gastro-intestinal tract; (*c*) pigmentation, principally hemosiderosis; (*d*) degeneration in the central nervous system affecting chiefly the reflex arches and the pyramidal nerve tract.

A chemical examination of the central nervous system showed that both varied markedly from the normal but resembled each other.

The author believes that unquestionably pellagra has not been produced in animals, but that certain symptoms and pathological changes resembling those of pellagra, have been observed in animals on a restricted vegetable diet.



Goldberger and Wheeler produced a mild pellagra in 6 out of 11 volunteers in 5 months on a restricted vegetable diet.

A considerable number of facts, therefore, support the theory that pellagra is due to a restricted vegetable diet. However, certain Eastern races live on a vegetable diet without contracting the disease. A study of the diet in the South where pellagra is endemic reveals the fact that in this diet, corn, wheat, and vegetable or animal "depot" fat are abundant while green vegetables are relatively unimportant; while the vegetarians of India and Japan include more green foods in their diet. McCollum has shown that a properly balanced mixture of seeds and the leafy parts of plants may form a satisfactory diet. Moreover, the wheat foods and hominy used in the South were highly milled, and these are more deficient in antineuritic and fat-soluble vitamin and in organic salts than are whole cereals. Furthermore the meal is often cooked in such a way as to destroy the antineuritic vitamin.

It is obvious that the nature of the dietary deficiency is complex and may be due to a combination of deficiencies in some of the well-recognized food factors.

J. B. NEAL.

HUTCHINSON, R. H.: Experiments with Steam Disinfectors in Destroying Lice in Clothing. *The Journal of Parasitology*, 1919, vi, 65.

Experiments at Camp Mills show that the eggs and adults of the body louse are destroyed by steam sterilization if the clothing is subjected to at least a temperature of 75° C. (167° F.) brought about by the following treatment: preliminary vacuum of 10 inches maintained for five minutes; then steam is applied at 15 pounds pressure for fifteen minutes, reckoned from the time the steam is turned on; then a drying vacuum of 10 inches is maintained for 10 minutes. The following precautions should be taken if less than 15 pounds pressure is used:

- (1) The treatment should be prolonged.

- (2) The sterilizers should not be overloaded as penetration is hindered by tight packing and the center bags are not sterilized.

(3) If the pressure is low, the 15 pounds necessary are reached slowly; this calls for prolonged treatment.

(4) The preliminary vacuum is absolutely necessary for perfect penetration.

(5) Finally, the manner of making up the rolls is important. A loose light roll is more easily penetrated than a heavy, tightly packed mass. In general, the primitive, portable sterilizer was found to be more efficient than the large stationary one. Tests of the amount of shrinkage resulting in the above treatment showed that only a slight amount occurs.

L. GREGORY.

EMBLETON, D.: Sphenoidal Empyema and Epidemic Cerebrospinal Fever. *British Medical Journal*, Jan. 3, 1920, No. 3079, p. 7.

The primary site of a meningococcus infection in the human body is undoubtedly in the nasopharynx. In thirty-four necropsies of persons dying from cerebrospinal fever, empyema of the sphenoidal sinus was found in thirty-two cases. In 10 cases of hydrocephalus following acute epidemic meningitis, empyema of the sphenoidal sinus was found in each case, but in 47 cases with complete recovery, there was no empyema of this sinus. Since, however, in the recent outbreaks of influenza, empyema of the sphenoidal sinus was frequent, but meningitis rare, it is not necessary that an empyema of this sinus be followed by meningitis. Operation for drainage of the sinus in acute cases, not only did not give any benefit, but seemed to shorten the time of the fatal termination.

L. C. JOHNSON.

PLICQUE, A.: The Etiology and Etiological Treatment of Insomnia (Las causas e o tratamento causal da insomnia). *Brazil-medico*, Rio de Janeiro, March 13, 1920, No. 11, p. 173.

(1) *Syphilis*.—Insomnia in syphilis generally depends upon the psychologic breakdown in the patient which is caused by the fear following infection. It is more serious in the third stage of the disease. The treatment consists in psychotherapy and in the use by

mouth, hypodermically or otherwise of high doses of mercury and iodids. Rebellious insomnia in an old syphilitic case has a bad prognosis.

(2) *Malaria*.—When the malarial attack occurs in the morning, insomnia is seldom pronounced; when it occurs in the afternoon, insomnia is persistent. Treatment consists in giving quinin three hours before the patient retires.

(3) *Infectious Diseases in General*.—Insomnia is very frequent at the onset of such diseases, and during the period of incubation they are very often an advertising symptom. For instance, when insomnia without any apparent cause is observed in a wounded man, tetanus should be feared. The treatment consists in antipyretics. In case of insomnia induced by tuberculosis, cryogenin produces remarkable results.

(4) *Anemia*.—The treatment consists in placing the bed of the patient in a slanting position so that his feet are higher than his head. Life in the open and a ferrous tonic are advisable. Opium is a good sedative in such cases on account of its slight congestive action upon the brain.

(5) *Cerebral Hyperemia*.—While bedfast, the patient must keep his head high, and must avoid large meals and alcohol.

(6) *Reflex Disturbances*.—(a) If they are of gastric origin, any overcharge of the stomach provokes insomnia. The treatment consists in regulated meals; as a hypnotic, cannabis indica may be used. (b) They may be of intestinal origin. Meteorism is a frequent cause of insomnia, also intestinal parasites. A visceral affection or amenorrhea may be the cause of insomnia. (c) They may be of vesical origin.

(7) *Dyspnea*.—Insomnia always produces dyspnea. Opium is the best remedy for it. But there is a special kind of toxo-alimentary dyspnea in which opium is of no avail. Its treatment consists in the use of diuretics and diaphoretics, especially theobromin.

(8) *Intoxications*.—In this case the only treatment is the removal of the cause.

The nervous essential insomnia requires complicated treatments which are interesting only to the specialists in nervous diseases.

C. F. ARROYO.

GOODMAN, H., AND YOUNG, W. J.: A Clinical-Pathological Study of an Unusual Syphilitic Manifestation Resembling Juxta-articular Nodules. *The American Journal of the Medical Sciences*, Feb., 1920, clix, Part 1, No. 575, p. 231.

Juxta-articular nodules were first described by Jeanselme in 1899 among the Indo-Chinese. Goodman and Young report a case in an American woman of twenty-nine years of age. Symmetrical gummata of the tendons are described, first noted by the patient eight years previously. A suggestive history, positive Wassermann, histology, and characteristic findings led to the diagnosis of multiple syphilitic gummata of the tendons.

A. T. MAYS.

SWIFT, H. F.: Trench Fever. *Archives of Internal Medicine*, July 15, 1920, xxvi, No. 1, pp. 76-98.

Swift's survey deals with the results of the investigations of the American and British commissions appointed to study Trench Fever. This disease is estimated to have effected between 800,000 and 1,000,000 troops during the war. There were practically no fatalities, but the morbidity rate was extremely high. The outstanding clinical features of typical cases were: Sudden onset with marked febrile reaction, headache and general body pains, closely resembling the onset of influenza, but followed in a few days by pain and tenderness in the shins, and a spiky type of relapsing fever. Many patients who complained of painful shins, especially at night, had no history of abrupt onset or of a distinct febrile bout. In still others with similar symptoms the pyrexia was continuous, resembling that of typhoid fever, or it was intermittent like that of sepsis. The many clinical forms of the disease are apparently not due to the action of different types of organisms, but to single or multiple infections with a single type of organism. The etiological agent behaves in a manner similar to that of many of the filter-passing organisms. The virus is found occasionally in the sputum, often in the urine and always in the blood at some stage. It is carried by the body louse, being found in the excrement and bodies of practically all lice that have fed several times on trench fever patients, after an interval of from five to ten



days after the infecting feed. The virus is not transmitted to the larvæ of lice through the eggs. Rickettsia bodies are found in the bodies of infected lice, and are demonstrable with difficulty in the blood of patients during the period of pyrexia. The rôle of these bodies, however, as well as their relation to microorganisms in general, remains to be established.

While men may be infected by the simple bites of infected lice, they are more surely infected by applying the excrement of such lice to the scarified skin. Infected lice living under normal conditions transmit the disease to the majority, if not all, men harboring them. As a direct corollary, the eradication of lice is followed by an eradication of the disease.

T. HOWARD.

LUMSDEN, L. L.: Rural Hygiene. *Public Health Reports*, Nov. 7, 1919, xxxiv, No. 45, pp. 2518-2538.

Under modern conditions there are so many connections, especially in the way of food supply and travel between the country and the city, that the sanitary conditions of the rural districts bears a very important relation to the health of the urban communities. In addition over 50 per cent of the population of the United States is rural. For these two reasons it is impossible to over-estimate the importance of rural hygiene to the national health.

The terms "Hygiene" and "Sanitation" are often used interchangeably. A definition of "Sanitation", given by a little school girl, especially appeals to the author. "Sanitation means getting things clean and keeping them clean". Cleanliness is freedom from dirt. Dirt may be harmless or dangerous. Waste matter from human beings is dangerous dirt because in it are found the germs which cause communicable disease.

*Eruption of Disease.*—In each of the communicable diseases there is what may be termed "the eruption of the disease". In smallpox it is in the skin and mucous membrane; in diphtheria, scarlet fever, "catching" colds, influenza, mumps, measles, and probably in poliomyelitis, it is in the nose and throat and a case of any of these diseases indicates that into the nose or throat of that person there has been introduced the erupted matter from the nose or throat of some

other person; in pulmonary tuberculosis and the pneumonias, the eruption is in the lung; in malaria, it is in the blood; in typhoid fever, the dysenteries, Asiatic cholera, and hookworm disease, it is in the intestines. The continued prevalence of the diseases caused by excreta-borne infections shows a woeful lack of observance of the most elementary sanitary principles. The first reference known by the author to the eruption of disease as a basis for sanitary procedure was made by Wm. Budd in a monograph on typhoid fever in 1873.

*Principles of Hygiene.*—One of the main principles of hygiene is the institution of a consistent observance by individuals and communities of cleanly methods of living in preventing the "erupted matter" or "dangerous dirt" from the bodies of infected persons from being conveyed to the bodies of other persons. Another important matter is the establishment and maintenance of conditions in respect to air, water, food, exercise, and sleep, which tend to fortify individuals with health and the power to overcome the invasion of the body by "dangerous dirt". The rural district has the advantage of dilution of population in preventing the spread of communicable diseases; the urban population has the advantage of economic procedure in carrying out mass sanitary measures, such as the installation of a clean water supply, adequate sewerage system, etc.

The hygienic advancement of the larger cities has been far greater than that of the smaller cities and rural districts. Certain diseases, such as hookworm, malaria, typhoid fever, dysentery, and tuberculosis are more prevalent in rural sections than in cities. Many simple, inexpensive, and elementary sanitary measures are neglected on farms. In over 50,000 typical farm homes, only 1.22 per cent were provided with sanitary toilets; in 68 per cent the water supply was exposed to contamination with human or animal excreta; in only 32 per cent were the dwellings screened to prevent flies contaminating the food. Easily drained ponds of water near the dwellings provided a convenient breeding place for mosquitoes, with the danger of malaria resulting. Patients suffering with pulmonary tuberculosis were staying in poorly ventilated rooms, relying on patent medicines, instead of availing themselves of the farm "medicine"—fresh milk, fresh eggs, and fresh air. The physical examination of young men drafted for the army showed a high degree of physical inefficiency, much of which was the result of preventable or correctable conditions.

Under the existing conditions of travel and the distribution of food supplies, insanitary conditions in rural sections may seriously affect the health not only of the immediate community, but also of cities both of the same and of other states. Therefore, the problem of rural sanitation belongs to the county, state, and national health authorities.

Health work presents so many branches that whole-time health organizations are essential to success. In addition to the necessary scientific training, the personality of the health officer is very important. He must be able to judge what problems are most important in his locality, and yet he must be ready to meet emergencies as they arise. The health organization will vary greatly, depending upon the size of the community. County demonstration work is now being conducted by the Public Health Service—the county paying one-half of the expense, the State Board of Health one-fourth and the United States Public Health Service one-fourth. This has furnished a remarkable opportunity to study and solve the problems and possibilities of county health work, and has also made it possible to obtain concrete results in various branches of sanitation, such as controlling mosquitoes or securing sanitary disposal of excreta in localities where malaria, typhoid or hookworm disease are prevalent. This has served also to convince the citizens of the value of public health and of the necessity of continuing and extending it.

J. B. NEAL.

MULLER, L. R.: On Thirst. *Deutsche medizinische Wochenschrift*, xlv, No. 5, p. 113.

Müller summarizes his conception of the sensation of thirst as follows:

(1) Just as the sensation of the need of evacuating the bladder and rectum, so the sensation of the need of taking solid or liquid food is conveyed to consciousness by means of contractions of the unstriped musculature.

(2) The desire (hunger) for solid foods is indicated by contractions of the empty stomach; the desire for drink (thirst) is produced by changes in the tension of the musculature of the pharynx and esophagus.

(3) These contractions are brought about by impulses from the mesencephalon (midbrain) and conveyed through the vegetative nervous system (vagus and sympathetic).

(4) Diminution of the water content of the blood is much less of a thirst stimulus to the midbrain than the increase of the crystalloid materials of the blood-serum which raises the osmotic pressure.

(5) In cases of intense thirst there are, in addition to the local irritation of the esophagus, also disturbances of the organism and emotion (disposition), which can be traced to the general deficiency of the water content of the tissues and brain.

M. KESCHNER.

PRINGLE, S.: The Early Symptoms of Cancer of the Colon. *The Dublin Journal of Medical Science*, May, 1920, Series IV, No. 3, p. 136.

The importance of early diagnosis and operation for cancer of the colon is emphasized. One-half of the cases studied involved the pelvic colon, and tumor in this region cannot be palpated; hence, the persistence of symptoms of ulceration and stenosis of the bowel without discoverable cause justifies exploratory operation.

G. A. DISTIE.

PAL, J.: The Problem of Tonus of Smooth Muscle and its Significance as far as Therapy is Concerned. *Deutsche medizinische Wochenschrift*, Feb. 5, 1920, xlv, No. 6, p. 146.

The author summarizes his conception of tonus of smooth muscle as follows:

The state of tension of a living muscle cell depends on two elements: (1) The kinetic element; and (2) the tonus element. The tonus element is not the same as muscle irritability. Muscle tonus is a function, whose purpose is to regulate kinetic processes. This regulating mechanism naturally leads to reparatory states, such as is observed in conditions of secondary hypertonus. In the present state of our knowledge it is not known why hypertonus results pri-



marily from disturbances of function. When the hypertonus is in the nature of a reparatory process, there are no therapeutic indications for such hypertonus. This conception of tonus as a function is a new one. The relation of tonus to inhibition, muscular hypertrophy or atrophy, reflex action, etc., still remains an open question, the study of which promises to shed more light on the life processes of smooth muscle. Such studies will eventually lead to a better understanding of the diseases resulting from abnormal muscle tonus.

M. KESCHNER.

SCHADE, H.: Investigation into the Question of Catching Cold (Untersuchungen in der Erkältungsfrage). *Münchener medizinische Wochenschrift*, April 16, 1920, No. 16, 449.

The author treats his work entirely from a physical standpoint. Cold, he believes, changes the colloids of the tissues, which are in a sol form, into a gel form. If this remains temporary and is reversible, the secondary factor of bacteria infection does not follow. If, on the other hand, the reaction remains irreversible and assumes a permanent gel form, bacterial invasion becomes a factor. He cites experiments on the cornea, which becomes cloudy and opaque according to the degree of exposure to cold. He thinks that young tissues, as exemplified in young plants, are more prone to the effects of cold. He attributes this to the increased water content. This, he thinks, might explain the greater susceptibility of young children to the effects of cold. He classifies all individuals as pleothermes or poeothermes, depending upon their ability to withstand the action of cold.

As a contributing factor to the action of cold, we have the action of the blood-vessels and of the nervous system.

H. JOACHIM.

SMITH, J. W.: Atony and Prolapse of the Large Intestine. *British Medical Journal*, Feb. 21, 1920, No. 3086, p. 243.

A classification of the different types of prolapsed colons is first given; then there is given an enumeration of the anatomical and developmental conditions—bands, kinks, and adhesions—which have

been offered as causes for stasis. The author's experience agrees with that of Keith in that he has never found at operation a case which showed the usual signs of chronic obstruction—marked constriction at the site of narrowing with hypertrophy of the muscular coats which must force the contents past an obstruction. In stasis the bowel is dilated, the walls are thin and atonic, and there is marked sacculatation, and more or less kinking or distortion. Whether this stasis is due to mechanical causes, or to disturbed neuromuscular action of the alimentary tract, as Keith believes, is not now definitely determined, but the writer has observed the following clinical manifestations:

The majority of cases have a distinct starting point, a severe attack of abdominal pain, confinement to bed for a varying period, and then a continuance of the pain after the attack, more marked at intervals, and with a tendency to become shorter. These conditions suggest chronic appendicitis, or angulation at the hepatic flexure. More rarely the pain is on the left side; there is usually tenderness at the original site of pain, and in "ceacal colon" a succussion splash is present below the level of the umbilicus. Constipation, though frequent, is not constant. Dull aching pain and a feeling of weight in the abdomen is very constant; it is associated with the erect posture, and is relieved by lying down. Gastric, or duodenal trouble, is sometimes found in connection with vomiting, but whether it is reflex or mechanical is not determined. Abdominal crises such as are seen in floating kidney also occur, and marked pulsation of the abdominal aorta is frequent. The late cases are amenable only to surgical treatment; the early cases are medical, and if recognized and properly treated, may be cured or considerably ameliorated.

Treatment consists of: Exercise of the abdominal muscles; support of these muscles, if necessary; and the use of mineral oil, or cathartics, if they are needed to insure a daily evacuation.

L. C. JOHNSON.

WEISE, H.: On Late Death after Skull Injuries (Über Spätktod nach Schädelverletzungen). *Deutsche medizinische Wochenschrift*, April 15, 1920, xlv, No. 16, p. 431.

Weise recalls that after cranial injuries a meningitis, encephalitis, or abscess of the brain, which invariably ruptures into the ventricle,

develop quite frequently and suddenly, although the patient may appear to be in the best of health. Usually these posttraumatic cranial complications make their appearance very soon after the trauma has been received; less frequently, however, they may not appear until after weeks, months, or even years have elapsed after the injury.

Three such cases came under the author's observation:

(1) H. received a wound in the right side of the face, on Nov. 21, 1914. On May 11, 1916, after the removal of some sequestra from a small suppurating fistulous tract in the right side of the root of the nose, he was discharged "cured". He was perfectly well until March 8, 1918, when he became suddenly ill with cerebral symptoms. An operation was followed by death. At autopsy the diagnosis of meningitis was justified. Three and a quarter years elapsed between the receipt of injury and death. In the meantime he was well and able to work.

(2) P. received a wound of the skull May 12, 1917. He underwent two plastic operations for cranial defects. Jan. 1, 1918, he was discharged from the hospital; the wound was completely healed. The subjective complaint was chronic headache. On April 1, 1919, some small sequestra were removed. On May 7, 1919 the patient was discharged feeling perfectly well. Three months later he became acutely ill with cerebral symptoms. August 14, 1919 there was an evacuation of the cerebral abscess. August 29, he died from encephalitis and from the rupture of an abscess into the ventricle. Death occurred two years, and three and one-half months after the receipt of the injury. The patient was comparatively comfortable throughout this entire period.

(3) S. received a bullet wound in the head, March 9, 1916; he was operated upon in the hospital and returned to military duty on May 3, 1916 with a well-healed wound. June 2, 1916, he was readmitted to the hospital on account of headaches; the wound was reopened and the findings were negative. On August 10, 1916, the x-ray showed the presence of a foreign body (in the skull?). August 25, 1916, the temperature was normal. From this time on the patient was well. Jan. 25, 1917, he was seized by an acute illness with cerebral manifestations. An operation effected the removal of a foreign body. On Jan. 31, 1917, the patient died. At autopsy

there was confirmed a diagnosis of meningitis, encephalitis and cerebral softening with perforation into the ventricle. This patient was apparently well for ten months after he had been wounded.

The literature, says the author, does not contain very many reports of cases in which so long a time elapsed between the receipt of the injury and the fatal termination. Recently von Prym reported a case in which a man with suicidal intent, shot himself in the mouth; he died five years later of meningitis. The latter was probably due to secondary infection.

Merkel found in the literature 8 cases in which the periods between the trauma and death ranged from 7 weeks to 21½ years.

In 1918 Chiari was able to collect 33 cases from the recent war in which death due to purulent meningitis set in from four to one hundred and twenty-seven days after the injury.

All writers emphasize the comparative well-being and ability to work in these patients during the intervals between the injury and the onset of fatal cerebral symptoms.

Chiari and Merkel attribute the cerebral involvement to a direct extension of the inflammatory process from the cranial or dural wound to the meninges by means of the perineural lymph-sheaths and thrombophlebitis. Von Bergmann thinks it is due to a periostitis which leads to suppuration and necrosis. Other observers think that a "late" meningitis or a "late" brain abscess is produced by a secondary accidental general blood or lymph infection, from which the microorganisms invade a *locus minoris resistentiae* in the nature of a latent area of cerebral softening, caused by the original trauma.

From a study of the available statistics on this subject Weise concludes that the ultimate prognosis in injuries to the skull is absolutely unfavorable, and this is true no matter how trivial the injury at the time of its infliction may appear.

The question of prognosis in these cases is of practical importance in connection with life insurance. Weise is of the opinion that an individual who has sustained an injury to the skull should not be given life insurance until two years have elapsed from the date of the injury provided there is no defect in the skull, and that a cranioplastic operation has been successfully performed; or at least one year after the plastic wound has completely healed, and even then the applicant is to be "rated" five years "higher" than his actual age.

M. KESCHNER.



BROSIUS, O. T., AND BISHOP, W. A.: Diseases due to Intestinal Parasites, in Columbia, and Their Treatment. *The Journal of the American Medical Association*, June 26, 1920, lxxiv, No. 26, p. 1768.

The points of interest in this article are:

(1) The very general infection by some form of parasite of 98 per cent of the natives of the district.

(2) The very general occurrence of two or more coincident infections, particularly *Uncinaria*, *Ascaris* and *Terichocephalus disparatus*.

(3) The low average hemoglobin. The writers conclude that 70 per cent is a fair average for healthy natives. They raise the question whether this may not be generally true of all equatorial America. Improvement in hemoglobin content is slow for adults and fairly rapid for children. Infected patients show an average of 47 per cent.

(4) Eosinophilia averaging nearly 11 per cent was found in 89 per cent of chronic hookworm cases. The authors note nausea and vomiting, general depression and diarrhoea as unusual symptoms. Abdominal pains which are at times noticeable, always indicate *Ascaris* or *Uncinaria*.

(5) Oil of *Chenopodium* has been their main reliance. It has been particularly effective against hook and round worms, and slightly so against strongyloides. They have not found it useful with *Endameba histolytica*, but have used emstin-bismuth with satisfaction. Whipworms are expelled by *Chenopodium*, but the ova persist. Their earlier experiences with doses of oil of *Chenopodium* of 48 minims resulted in several cases of deafness and four deaths, one in their own series, three in the practice of another observer. They now use from 35 to 40 minims, giving two or more treatments, with only occasional temporary deafness. No preliminary diet restrictions or purges are necessary. "A strong adult is given 3 capsules. two hours later two capsules and after two hours, three capsules more. Three hours later 2 ounces of castor oil are given. An adult woman receives generally only six capsules in the entire treatment, three doses of two capsules each, followed by the castor oil. It is safe to give a child 1 minim for every year of his age. In all cases, if there is much depression, the last dose is omitted."

H. G. WEBSTER.

FRAENKEL, E.: Some Observations on Acute Yellow Atrophy of the Liver (Bemerkungen über akute gelbe Leberatrophie). *Deutsche medizinische Wochenschrift*, Feb. 26, 1920, xlv, No. 9, p. 225.

In this paper Fraenkel attempts to disprove Umber's contention (*Deutsche Medizinische Wochenschrift*, 1919, No. 20) that the post-mortem findings of acute yellow atrophy of the liver, as far as that organ is concerned, are postmortem changes and nothing like those seen in this disease in the liver *in vivo*.

The author bases his conclusions on the following case: A twenty-nine year old man who had never suffered from jaundice or biliary colic became acutely ill with jaundice on May 27, 1919. He had no pains in the abdomen. On the next day the jaundice became more intense and the patient felt unusually weak. On June 1, his mentality was quite clear. His liver was palpable, his spleen not enlarged, his urine dark greenish brown in color and containing leucin, tyrosin and hematin. Upon these facts, the diagnosis of acute yellow atrophy of the liver was established. Because acute obstruction of the common bile-duct could not positively be excluded, an exploratory laparotomy was undertaken. Fraenkel had an opportunity to examine the liver *in vivo*. The liver appeared remarkably small; it extended two-thirds of a finger breadth behind the free costal margin. The upper surface appeared brownish red in color; there were numerous dark brown, bluish red nodules; some of them were of the size of a head of a pin; others were as large as a pea; some of them were isolated and others were confluent. Most of them were in the vicinity of the suspensory ligament. This part of the liver was somewhat harder in consistency than the remaining portions. The nodules were not bile-stained. A piece of liver tissue with one of these nodules was excised for microscopic examination. Ten hours after operation the patient died. Twelve hours after death the liver was removed from the body and examined. It weighed 950 grams (2.09 lbs.) and measured 25 by 14 by 16 cm. The consistency of the organ was the same as during life. Except for the total absence of a bile-stained color on the surface of the nodules, such as is always met with in the "postmortem" liver of acute yellow atrophy, there was no difference in the appearance in the organ postmortem and *in vivo*, and this was true in spite of the fact that twelve hours had elapsed

between the time of death and the removal of the organ. Microscopically the lesions were typical of the acute stage of atrophy of the liver. The blood and bile were culturally absolutely negative.

From this case, Fraenkel is convinced that there are no justifiable grounds for Umber's claims that the postmortem findings in the liver of acute yellow atrophy are postmortem changes. Since then Fraenkel has had two more occasions to confirm the truth of his belief.

In the next part of the paper the author takes issue with Umber, that in uncomplicated cases of acute yellow atrophy of the liver, ascites does not occur. Fraenkel's clinical and pathological studies absolutely disprove Umber's contention in this respect.

The last part of the paper is devoted to the discussion of the etiology of acute yellow atrophy. According to Umber the disintegration of the liver parenchyma is brought about by a process of autolysis which is due to infections or toxic processes, and the dominating rôle in the infection is played by the biliary channels. Were this true, Fraenkel says, it would mean that every case of this disease would have to show some evidences of cholangitis. This was not the case in most of the livers examined by the author. Nor can Fraenkel corroborate from his own experience the stand taken by many authors that the disease is due to syphilis. There is no doubt that many syphilitics develop acute yellow atrophy of the liver, especially those who are subjected to intensive mercurial treatment. Engel-Reimers had pointed out this fact thirty years ago. But, if one will take into consideration the large number of cases of acute yellow atrophy of the liver which is clinically met with, the conclusion will be inevitable that there must be "something else" which brings about such a fatal accident. There is no doubt that there are many other poisons which are able to produce acute yellow atrophy, and Fraenkel believes that these poisons are "endogenous" in nature; their source of origin and under what conditions they arise, he cannot state.

To what extent bacteria play an etiological rôle in the disease, the author cannot answer. Of the last 6 cases that came under his observation, he was able to establish culturally in 3 cases, the presence of bacteria both in the blood and in the bile of the bodies of the deceased patients. In 2 of these cases he found the hemolytic bacterium coli. One of these patients was a twenty-one year old woman who had worked for six weeks in a benzol factory; slowly thereafter she had developed acute yellow atrophy of the liver and had died.

The author does not know how much the benzol influenced the development of the disease, nor does he know what rôle the bacterium coli hemolyticum played in the etiology of the condition. The second case was in a four year old girl who became jaundiced three weeks before admission to the hospital. On the day prior to admission she suddenly began to vomit. This condition bore no relation to the taking of food. The day after admission she became unconscious and died the next day. The third case occurred in a twenty-five year old woman who died three days after admission to the hospital. Fraenkel was able to demonstrate the presence of the paratyphus B bacillus both in the blood and in the bile. The liver weighed 840 grams (1.83 lbs.) and presented the classical picture of acute yellow atrophy. The rôle played by the typhus and the paratyphus bacillus group in the production of cholangitis is well known. The absence of a cholangitis, however, in any of the cases reported, leads the author to disagree with Umber's view that the infection occurs through the bile-ducts. To answer these questions, further careful bacteriological investigations must be carried out. The author's investigations have yielded no definite results. The hemolytic colon group has been found extremely virulent to the guinea pig, but they do not produce the lesions of acute yellow atrophy of the liver, and this is true in spite of the fact that these animals are especially adapted for experimental studies of cholangitic processes, and for the experimental production of Weil's disease.

M. KESCHNER.

LERICHE, R.: Internal Pericarotid Sympathectomy. *La Presse médicale*, May 15, 1920, xxviii, No. 31, pp. 304-5.

The removal of several centimeters of the sheath of sympathetic nerve-fibers which surrounds the internal carotid artery, produces the following results:

- (1) *Primary*.—Marked constriction of the carotid.
- (2) *Secondary*.—(a) The symptoms typical of the removal of the superior cervical ganglion were noted, i. e., enophthalmos, ptosis, myosis, and dilatation of the conjunctival vessels. (b) Vasodilation.



From a study of 4 cases, Leriche concludes that excision of the entire cervical ganglion is unwarranted, since excision of some of the sympathetic fibers in the neck produces the desired results. In Graves' disease, the ocular symptoms may be cured by pericarotid sympathectomy, the tachycardia may become less marked after section of the superior cardiac nerves and resection of the sympathetic fibers around the superior thyroid artery. In trifacial neuralgia, internal and external pericartoid sympathectomy may afford relief.

The marked diminution in the caliber of the carotid following irritation of its sympathetic nerve-fibers may result in marked cerebral anemia, which, in turn, causes death. This fact may explain the sudden deaths that occur in wrestling matches and hangings. In order to avoid hemorrhage in operations on the brain this means of reducing the size of the carotid and lessening the blood flow to the brain may be useful.

S. KAHN.

MUSSEY, JOHN H.: The Application of the Cardiovascular Studies of the War to Civil Practice. *New York Medical Journal*, Nov. 29, 1919, cx, No. 22, p. 877.

The material upon which this paper is based came under Mussey's observation while he was acting as cardiovascular examiner of the thirty-eighth division, during which time 944 soldiers were referred for study on account of some objective disturbance of their cardiac mechanism, and while on duty in Base Hospital No. 20 in France.

During the examination of the thirty-eighth division he saw 3 cases of dextrocardia, in none of which was there complete transposition of the viscera. Only one of the men knew of his abnormality. He also saw 3 cases of congenital valvular disease.

Inasmuch as the apex of the heart is normally from 7 to 9 cm. beyond the midsternum in the fifth interspace, an apex found beyond these margins called for a study of the cause. In a certain number of cases excessive muscular development could be held responsible for such an abnormal finding, but that diagnosis was never made until all other possibilities could be excluded. Changes in the size of the heart whereby the percussion dullness extended to the right of the sternum or upward above the third rib were indicative

of damage to the heart musculature, which is after all the final criterion upon which to base one's opinion as to what the heart can and should do.

Another diagnostic point that one is prone to overlook, according to Musser, is that thrills may occur in various pathological heart conditions, and even when the heart is apparently normal. He cites Morris and Friedlander, who have called attention to a functional presystolic thrill, and cautions physicians to remember that a presystolic thrill is not necessarily indicative of mitral stenosis.

In addition to the ordinary cardiorespiratory murmur, he met with a good many murmurs which he eventually considered to be accidental, although he had heretofore considered them to be the murmurs of syphilitic aortitis; these were rather soft blowing systolic murmurs, best heard over the second right costal cartilage and transmitted up the vessels of the neck, with repeatedly negative Wassermann reactions, without changes in the size of the heart, with good functional response, without a history or signs of syphilis or of any acute infectious process.

He also calls attention to the fact that valvular lesions may exist without the occurrence of cardiac murmurs when the heart is auscultated in the usual upright position. He has also seen typical cases of aortic insufficiency with huge hearts, characteristic vascular findings, etc., without aortic diastolic murmurs. These cases may be correctly diagnosed without further investigation, but the examination of borderline cases in young, apparently healthy, males is not complete without auscultating the heart in the prone and lateral positions, and after exercise. Change in position, or exercise, will bring out many murmurs which may be suspected, but can not be demonstrated with the patient sitting quietly in the usual upright position.

Among the unusual auscultatory findings the so-called apical click and the third heart sounds were noted. Both of these are apparently of no significance; the first is rare, the second quite common. Extra systoles in apparently normal men were occasionally met with, but auricular fibrillation and paroxysmal tachycardia were never seen by the author during the cardiovascular examinations nor in the examination of several thousand soldiers at the Base Hospital in France. He was, however, greatly struck by the frequency with which cases of tachycardia were observed in his examinations in the thirty-eighth

division. The 424 cases which were referred to him with this diagnosis he classified etiologically as follows: (1) myocardial, 69 cases; (2) hyperthyroid, 97 cases; (3) neurotic, 180 cases; (4) nervous (emotional), 28 cases; and (5) toxic, 36 cases. (He does not account for 14 cases—Abst.) In France the great frequency with which men who had been gassed suffered from tachycardia was noticeable.

More intensive investigation has been carried on in attempting to elucidate the pathogenesis of "soldier's heart", "D. A. H." (disordered action of the heart), "irritable heart", "effort syndrome", and "N. C. A." (neurocirculatory asthenia). As a result of these studies the American medical officers reached the conclusion that the soldiers suffering from "D. A. H." were men who started with a certain constitutional inferiority. These men were neuropsychically unstable and had been so long before they were inducted into the service. In others an anxiety neurosis was apparently developed only when they were sent to camp, while in still others the neurosis did not manifest itself until they were actually engaged in the stress of warfare. In many of these cases, as well as in many of the shell-shock cases, the condition was markedly and rapidly improved after the patients were told that they had been acted upon by a disability board and were to be sent home or back of the lines.

Another striking phenomenon noted by Musser in the case of these men was their inability to stand progressively increasing exercise. He believes with Neuhof that the syndrome of D. A. H. is common in civil as well as in military practice, but for obvious reasons it is more noticeable in the latter than in the former.

The simple test of hopping on one foot 100 times he found of great value in determining insufficiency of cardiac function.

M. KESCHNER.

FREY, W.: Sudden Death in Cardiacs. *Correspondenz-Blatt für schweizer Aerzte*, Oct. 9, 1919, xlix, No. 41; reviewed in *La Presse médicale*, May 8, 1920, xxviii, No. 29, p. 29.

Acute death in cardiacs is characterized by a sudden cessation of the activity of the heart, and of respiration. The author has seen 17 such cases. His patients suffered from acute endocarditis, syphi-



litic aortitis with aortic insufficiency, myocardial sclerosis, or rheumatic aortic insufficiency.

The cause of the suddenness of death is obscure. Sudden myocardial insufficiency and disturbed conductivity and excitability cannot be accepted as explanations of this occurrence, because autopsy does not confirm the former, and because the latter is compatible with life for some time.

Hering has recently stated that sudden death is due to the sudden appearance of auricular fibrillation, but the author has never observed this in patients premortem. In addition, fibrillation does not result in instantaneous death, nor is it associated with the sudden cessation of respiration seen in cardiaes who die suddenly.

According to Frey, the sudden death is due to a nervous shock which affects the circulatory and respiratory centers, whose functional correlation is very intimate. Normally, respiration, vascular tone and cardiac activity result from stimuli reaching these centers from the viscera and the psychic zone. In cardiaes, the central regulatory mechanism is abnormally hyper-sensitive, and normal stimuli may produce marked reactions. In some cases, the cardiac condition itself is the prime cause of instant death, the excitation coming from the heart overstimulating the cardiac and respiratory centers and destroying their power to functionate. Such death is really reflex. Elevation of the intracardiac pressure and sudden weakness of cardiac contractility are especially liable to precipitate this reflex death.

S. KAHN.

CASCULESCU, M.: The Role Played by Aortitis in the Production of the Dicrotic Pulse. *Archives des maladies du coeur*, 1920, xiii, 24.

The wave produced by the closure of the semilunar valves in the aorta is represented by a slight notch on the sphygmogram, which cannot usually be felt. On the other hand, it may become distinctly perceptible to the palpating finger and constitute a second or dicrotic impulse of the pulse-beat. The dicrotic pulse depends upon the force of the heart beat and the peripheral resistance. The author here considers the influence of still a third factor, i. e., changes in



the semilunar valves and the wall of the aorta which would affect intra-aortic pressure.

In certain cases of aortitis, with or without semilunar involvement, the wall of the aorta loses its elasticity. The volume of blood is forced into the aorta by the systole of the ventricle, under great pressure. The recoil of the current from the periphery back to the aorta finds the latter unyielding and the blood in it under tension and rebounds from it again to the periphery as the dicrotic wave. If only a part of the aorta is effected or the sigmoid valves rigid, the same may occur. That is, the blood-current will return toward the periphery as a distinct dicrotic wave. In these cases there is a high diastolic pressure in the aorta with a ringing aortic second sound. In some cases, the dicrotic wave will be lost in the distortion of a sclerosed radial artery.

The author cites a case of aortic stenosis with a marked dicrotic pulse. Amblard has shown that when the arterial elasticity lessens, the inter-aortic tension is increased and exerts most of its force in the direction of the semilunar valves. He asserts that pure peripheral hypertension of organic vascular origin exists. Incidentally, this assertion tends to confirm the rôle played by aortitis in the production of hyperdicrotism.

M. KAHN.

RAMOND, C., AND PETIT, A.: The Sympathetic Syndrome. *Société médicale des hôpitaux*, Dec. 21, 1919; abstracted in *Archives des maladies du coeur*, 1920, xiii, No. 6, p. 278.

The sympathetic syndrome consists of:

(1) *Generalized Vasomotor Symptoms:*

- (a) Hot flushes in the face and warm extremities.
- (b) Cutaneous erythematous areas.
- (c) Tingling in the fingers and in the extremities.
- (d) Excessive perspiration of the hands and also, following effort, of the face.

(2) *Cardiac Signs:*

- (a) Palpitation, spontaneous attacks or after exercise.
- (b) Belching and epigastric symptoms.

- (c) Instability of the pulse after exercise.
- (d) The arterial pressure is generally normal.
- (3) *Pleuropsychic Symptoms*:
  - (a) Tremors.
  - (b) Excitability and states of anxiety.
  - (c) Mydriasis common.

The sympathetic syndrome shows transitory exacerbations which appear to depend upon an unbalance in sympathetic innervation (vaso-dilatation of the face and vasoconstriction in the extremities). By faradization of the inner aspect of the arm in these cases cyanosis and sweating of the hands can be produced.

M. H. KAHN.

AVIRAGNET, E. C., AND LITTLEMEACHER, R.: The Heart in Diphtheria. *Archives des maladies du coeur*, 1920, xiii, 1.

Diphtheritic toxin attacks the heart-muscle with almost equal severity, as the cranial nerves and the heart-lesion go hand in hand with the diphtheritic paralyses. Both are a common expression of the diphtheritic poison. The highly specialized nerve-tissue in the heart gives prompt indication of the toxemia.

The excitability of the nodal tissue is greatly affected. The heart becomes rapid with sudden changes of rate due to extrasystoles. That is, there are points of irritation along the bundle which supersede the sinus node. These points are rendered more excitable by the toxin than is the nodal structure, and they originate the premature contractions. Sinus arrhythmia may also occur.

It is rarely a single point of irritation which originates the extrasystoles or premature beats. Hume and Clegg, as well as the authors, observed extrasystoles of one type over a period of several days, and in one case recurring paroxysms of nodal tachycardia during several days, indicating a single point of bundle irritation.

More often the toxin affects the bundle diffusely and induces constantly changing points of dominant irritability, with changing rhythm of nodal, supranodal and ventricular types intermingling and alternating with sinus rhythm. The arrhythmia is complex and polymorphic.

The conductivity of the Purkinje tissue may become depressed and cardiac failure may set in as result of the toxic effects of diphtheria. On the contrary, with improvement, the irregularities may rapidly disappear. Tachycardia usually persists for a long time.

M. H. KAHN.

ROBINSON, G. C.: The Rapidity and Persistence of the Action of Digitalis on Hearts Showing Auricular Fibrillation. *The American Journal of the Medical Sciences*, Jan., 1920, cliv, Part 1, No. 574, p. 121.

The effect of large doses of digitalis was studied in 26 cases of auricular fibrillation and auricular flutter, selected after demonstration by electrocardiograms. The patients were studied while they were at rest in bed, and before they had previously been under the influence of digitalis. The tincture was given by mouth according to the method of Eggleston (one dose, or several frequent doses of the entire amount which gives the maximum effect); 0.15 c. c. (2.43 minims) were given per pound body weight, either in one dose or in three or four divided doses from four to six hours apart. The doses affected the heart at a relatively constant time, from two to five hours, indicating that the drug is absorbed from the alimentary tract at a fairly rapid and uniform rate. The maximum effect is usually obtained in about twenty-four hours and generally continues to be effectual from four to fifteen days, or an average of nearly ten days.

A. T. MAYS.

PEZZI, C., AND CLERC, A.: Action of Quinin on the Heart. *La Presse médicale*, May, 26, 1920, xxviii, No. 34, pp. 334-6.

From experimental evidence the authors conclude that quinin has a depressant action on the cardiac muscle—on its excitability, contractility and conductivity—and paralyzes the cardiac nerves.

Clinical study has shown that quinin produces a diminution in the size and in the rate of the pulse. In some cases of cardiac neurosis and in angina, quinin may bring relief. Wenckebach has successfully treated auricular fibrillation with quinin.

**THERAPEUTIC CONSIDERATIONS.**—(1) *Method.*—The preparations used by the authors are the hydrobromid, the hydrochlorid and the valerianate of quinin, administered *per os*. The dose per day should not exceed about 20 grains (1.3 gram), taken in 2-3 parts. Digitalis may be used in conjunction with the quinin.

(2) *Indications:*

- (a) Extrasystoles.
- (b) Paroxysmal tachycardia. In both of these conditions quinin is of value because it lessens the excitability of the myocardium.
- (c) Auricular fibrillation.
- (d) Auricular flutter. Quinin gives good results in fibrillation and flutter, because it lessens the irritability of the vagus, and diminishes the excitability of the node of Tawara.
- (e) Experimentally, quinin prevents fibrillation of the ventricles. Since cardiac failure after chloroform administration is due usually to ventricular fibrillation, quinin may be of value in these cases.

S. KAHN.

MARFAN, A. B., AND VANNIEUWENHUYSE, J. B.: New Research on the Blood-pressure in Chronic Pulmonary Tuberculosis (Nouvelles recherches sur la tension artérielle dans la tuberculose pulmonaire chronique). *Annales de médecine*, Paris, Jan., 1920, vii, No. 1, p. 16.

The conclusions drawn by the authors of this very minute study, after referring to previous research carried out by one of them, follows:

(1) In pulmonary tuberculosis of long standing the blood-pressure (systolic) is in most of the cases low. The lower the systolic or maximal blood-pressure, the more serious the case. The blood-pressure becomes gradually lower as the disease progresses. Notwithstanding this, in some cases of tuberculosis, blood-pressure may be permanently normal, or even high. In these cases the process of the disease is generally benignant; it progresses slowly or not at



all, and very often the patient improves and even becomes clinically cured.

But the above statement does not mean that a low systolic blood-pressure excludes the possibility of a clinical cure. Patients with low blood tension can improve, if the hypotension is not very marked. When applying this rule to practice, it must be born in mind that no conclusions should be drawn from a single measurement of the blood-pressure, but it should be taken many times and always under the same conditions, before any definitive statement regarding the prognosis of the case is made.

(2) In pulmonary tuberculosis the diastolic or minimal blood tension generally remains normal; only in the last stages of the disease does it become low. Its measurement has no practical use.

C. F. ARROYO.

HARPUDE: Blood-Pressure, Arteriosclerosis and Contracted Kidney. *Deutsches Archives für klinische Medizin*, 1919, cxxix, 74.

Harpuder has carefully studied the relation of blood-pressure, arteriosclerosis and contracted kidney in 1165 cases. Of these cases all but 17 were past forty years old. He concludes from the study of clinical and pathological material that arteriosclerosis alone does not cause hypertension, even if the smaller renal and cardiac vessels are involved. But the renal changes produced by the sclerosis of the smaller vessels do lead to arterial hypertension. The appearance of hypertension is independent of the severity and extent of the anatomical lesion. Every patient with persistent hypertension has already a renal injury.

M. H. KAHN.

BEJARANO, J.: The Epileptiform Crisis Consecutive to Neoarsphenamin Injections (Las crisis epileptiformes consecutivas a inyecciones de neosalvarsan). *El Siglo médico*, April 24, 1920, No. 3463, p. 302.

The author says that on account of the widely spread use of arsenical medication in the treatment of syphilitic manifestations

and the improvement of the method of administering such medications, most physicians neglect to test the patient's ability to stand the medication; as a result of this many disagreeable accidents may happen that could be avoided. To support the statement, the author reports the following history:

A patient nineteen years old had been treated for early syphilis by a long and continuous course of injections of insoluble mercury compound. When examined by the author, the patient presented patches in his mouth and suffered from headache in the afternoon; he also presented an incipient mercurial stomatitis. The author started a course of neosalvarsan injections, after he had tested the ability of the patient to resist it. After the first injection of 0.15 grams (2.315 grains) the patient suddenly became very pale and lost consciousness for a moment. This accident was very transitory and the author attributed it to the emotive condition of the patient. The next week he administered a new injection of 0.30 grams (4.63 grains) without any accident, but a few days after this he was urgently called to the bedside of his patient. He was told by the family that, after complaining in the afternoon of an intense headache accompanied by a very marked restlessness, the patient had had two convulsive attacks. The author witnessed one of the attacks and was convinced that they were purely epileptiform. After the attack, the patient passed into a state of coma which lasted half an hour. He had still another attack, but little by little the patient rid himself of the epileptiform manifestations. The accident had been produced without any doubt by the arsphenamin. The patient was restored to normal condition and could remember nothing that had happened. The author took the family history carefully and discovered that a younger brother suffered from epilepsy during many years, but the patient himself gave as psychopathic manifestations only a rather impulsive character. Arsphenamin was discontinued and the treatment was completed with intravenous injections of sodium cacodylate. The author thinks that although the accident is very seldom, its seriousness makes it worthy of consideration. Most of the modern authors are of the opinion that this accident is merely a symptom of encephalitis to which three-fifths of the mortality produced by the arsphenamins are attributed according to Meironsky and Kretzner.

" The author thinks that the epileptiform crisis subsequent to the use of arsphenamin can be divided into two classes: first, those which are only a symptom of hemorrhagic encephalitis, and second, those which are due to special conditions of the individual. Besides the toxic action of arsenic, the pathologic peculiarities of the patient have to be discovered if we want to avoid accident. However, most of the cases presenting this condition are real epileptics, whose difficulty had never been diagnosed as such. Notwithstanding all the difficulties connected with arsphenamin medication, the statistics published by Hazen prove that in 1910 there were sixteen deaths out of 50,000 injections, and in 1913, thirty-seven deaths out of 2,000,000 injections.

The author gives the following rules to avoid accidents:

(1) No treatment should be started with a higher dosage than 0.15 grams (2.315 grains) arsphenamin.

(2) Make the necessary tests regarding the patient's resistance such as urinalysis, careful physical examination, blood tension, and anamnesis in which it is assured that no history of epilepsy is present.

(3) If the case is of a suspicious character, use a smaller dose of arsphenamin, e. g. 0.10 grams (1.543 grains); or use the method of Daupre which consists in injecting endovenously from a half to one centigram of the arsenical compound before the full dose is injected.

C. F. ARROYO.

EDITORIAL: The Therapeutic Value of Oxygen. *The Journal of Laboratory and Clinical Medicine*, May, 1920, v, No. 8, p. 549.

There is no therapeutic measure which is less efficiently put into practice than the administration of oxygen, and as a consequence, most physicians have little faith in its value. There are several reasons for this state of affairs: In the first place, the physiological mechanism by which added oxygen could assist in the respiratory function is not understood; in the second place, an efficient amount of the gas is usually given; and in the third place, it is usually given too late. On the other hand, when oxygen is properly given in suit-

able cases before the patient has become moribund, much evidence has accumulated to show that very great benefit results from the treatment, and so far as can be told, a fatal termination is often averted.

In order to understand the physiological principles involved in this treatment, it is important to remember that, although forty to fifty times as much oxygen is combined with hemoglobin as is found in simple solution in the blood-plasma, yet it is the latter which really diffuses into the tissues. The pressure of oxygen in the plasma, in other words the diffusion pressure of oxygen, is the determining factor in causing it to permeate the tissues, and whenever this pressure begins to fall under normal conditions, more oxygen is added to the plasma by dissociation from the oxyhemoglobin of the corpuscles. The plasma retails the oxygen to the tissues and the corpuscles are the warehouses from which the plasma replenishes its stock. Therefore, an efficient supply of oxygen to the tissues could be maintained without any hemoglobin, if we were to put an excess of the gas into simple solution in the plasma. Oxygen administration can be of no avail in poisoning with coal gas or with any other substance which destroys the  $O_2$  carrying power of hemoglobin, unless it is forced into the alveoli so as to increase greatly the partial pressure.

In pulmonary edema, in "gassed" cases, in bronchitis, and in decompensated cardiac cases, oxygen is of undoubted value. Many cases of pneumonia are greatly benefited by the use of oxygen. When an excess of oxygen is breathed, the amount which goes into solution in the fluid will become proportionately raised, so that there will be a much better chance for a sufficient amount reaching the blood, saturating the hemoglobin, and creating proper plasma tension.

The success of treatment with oxygen in suitable cases must depend upon several factors, the most important of which are: (1) To get as much of the gas into the alveoli as possible; (2) to start the treatment early, before irreparable damage has been done because of anoxemia; (3) to maintain the administration until cyanosis has disappeared.

The importance of early administration is evident when we realize that the damage of oxygen deficiency on the nerve centers and tissues usually develops insidiously, and that once started the damage must lead to a progressive deterioration of the vital functions of the body. The respiratory center is the first to suffer from anoxemia, and the result is shallow and rapid breathing.



Regarding the method of administration, it may be said at once that the common clinical practice of placing in front of the patient's face a funnel connected with an oxygen tank is worse than useless. Where no special apparatus is obtainable for the administration of oxygen, the best method is to place a wide elastic rubber catheter in one nostril, through which the gas, after bubbling through water in a flask, is passed as quickly as is comfortable to the patient. The open nostril is closed by the attendant during each inspiration.

A very good method is one in which a flat metal tube (hollow tongue depressor) is connected by a wide rubber tube to a very easily manipulated respiratory valve, beyond which is a strong rubber bag attached to the rubber tubing coming from an oxygen cylinder. When the valve is in the respiratory position, the gas passes through the bag into the tongue depressor; in the expiratory position, it fills the bag and no gas goes beyond the valve, which is manipulated by the attendant about ten to twelve times a minute. The nose of the patient is to be clamped during inspiration.

C. M. ANDERSON.

THOMPSON, L.: Syphilis of the Kidney. *The Journal of the American Medical Association*, July 3, 1920, lxxv, No. 1, p. 17.

Thompson calls attention to the frequency with which the kidney is attacked in syphilis and tabulates:

- (1) Early involvement with
  - (a) Transient albuminuria.
  - (b) Acute and subacute nephritis.
- (2) Late involvement with
  - (a) Chronic interstitial and parenchymatous nephritis.
  - (b) Amyloid kidney.
  - (c) Gummas.

If one may be forgiven for making a critical analysis of the subject here presented, it may be questioned whether it would not have been better if the author had contented himself with calling attention to the fact that syphilis, like other infections, frequently attacks the kidney, producing manifestations varying with the degree of virulence and the part attacked, rather than with attempting

to erect a distinct nosological structure. It is a fact that the syphilitic origin of many nephropathies is often overlooked, and that some cases of nephrosis with low blood pressure, abundant albumin and "renal" edema clear up rapidly under antiluetic treatment. The author has rendered a service in emphasizing the fact that renal growths are occasionally gummatous, and that a positive Wassermann may often clear the diagnosis where renal symptoms overshadow those of the underlying syphilis.

H. G. WEBSTER.

ROGER, G. H.: The Role of the Bile (*Le rôle de la bile*). *Plus Ultra*, Madrid, Nov.-Dec., 1919, III, Nos. 17 and 18, p. 209.

Professor Roger has compiled in a very interesting article the results of the research carried out in recent years on the role played by the bile in the human system. His conclusions follow:

(1) The bile does not contain any digestive ferments, but it exerts a zymosthenic influence, that is to say, it increases the action of certain ferments—pancreatic amylase, intestinal lactase, etc.

(2) It possesses the faculty of attracting from the intestinal cells the ferments manufactured therein, especially invertin. This is the reason that the bile plays an important part in the digestion of certain sugars.

(3) It collaborates in the digestion and absorption of fats.

(4) It exerts special action on the albumins and peptones, precipitating them out of their acid solutions and redissolving them immediately afterwards.

(5) Although it does not possess any bactericide virtues, it impairs intestinal putrefaction in three ways:

(a) It favors the development of certain microbes, as, for instance, the colibacillus, with detriment to the anaërobic microbes, the principal elements of putrefaction.

(b) It diminishes the secretion of ferments elaborated by the bacteria.

(c) It impairs the action of the bacillary ferments upon the fermentable substances.

(6) It diminishes the action of the toxins produced by the intestinal bacteria.

(7) It avoids the coagulation of mucus by the intestinal mucinase; this is the reason that some troubles of the biliary secretion explain certain forms of mucomembranous enteritis.

(8) Its toxicity is weak and the accidents produced in cases of serious icterus ought to be traced, not to the biliary retention, but to the functional insufficiency of the hepatic cells which are incapable of stopping and transforming the poisons carried to them by the portal vein.

C. F. ARROYO.

ESCOMEL, E.: Efficient Medical Treatment of Intestinal Obstruction (Tratamiento médico eficaz de la obstrucción intestinal). *El Siglo médico*, Madrid, June 12, 1920, No. 3470, p. 433.

The author reports 5 cases of intestinal obstruction treated medically and emphasizes the importance of trying medical means before resorting to surgical measures. The medical treatment advised by the author is carried out as follows:

As soon as the diagnosis is established, an active revulsion of the stomach must be instituted. At the same time the patient should swallow small pieces of ice so they will melt in the gastric cavity.

Every fifteen minutes the patient will receive a tablespoonful of purified liquid petrolatum.

An injection of pituitrin is given intramuscularly in the gluteal region. The bed of the patient is put in a slanting position so that his head is lower than his feet. After four or five hours of this treatment a soft massage of the abdomen is started, following which the obstruction, no matter what its cause may be, should disappear. If it does not disappear after the massage, operation is necessary. The conclusions drawn by the author follow:

(1) Intestinal obstruction, especially when caused by the strangulation of a hernia, or by volvulus, ought to be treated medically before any surgical means are applied.

(2) Liquid petrolatum in large doses will reduce the obstruction in many cases.

(3) The treatment is harmless.

(4) In case of hernia, treatment will be helpful to the operative reduction.

C. F. ARROYO.

JACQUEMET AND GOUBEAU.: Therapeutic Uses of Carbon Tetrachlorid. Proceedings of the *Société de thérapeutique de Paris*, Mar. 10, 1920; reported in *La Presse médicale*, Apr. 7, 1920, xxviii, No. 20, p. 199.

Carbon tetrachlorid dissolves iodine, camphor, caoutchouc, fats, essential oils, etc., and has several important therapeutic uses:

- (1) *In Surgery*.—(a) Disinfection of the hands by a solution of iodinated carbon tetrachlorid.
- (b) Protection against infection by a solution of caoutchouc in carbon tetrachlorid.
- (c) Disinfection of fistula and ragged wounds by a solution of camphor or iodine in carbon tetrachlorid.
- (d) Preservation of instruments.
- (2) *As a Parasiticide*.—Destroys lice and nits.
- (3) *In Dermatology*.—For the treatment of seborrhoea, pityriasis, certain forms of acne, and certain mycotic diseases of the skin, pure  $\text{CCl}_4$ , or  $\text{CCl}_4$  with iodine, sulphur, camphor and the essential oils is valuable.

S. KAHN.

BERNARD, L., MANTOUX, C. AND JACQUET, P.: The War as a Determining Factor of Pulmonary Tuberculosis (*La guerre comme facteur déterminant de tuberculose pulmonaire*). *Annales de médecine*, Paris, 1920, vii, No. 1, p. 37.

The authors are of the opinion that what the physicians of the Allied countries call *war tuberculosis* is not the development of a tuberculous predisposition as was generally thought. War tuberculosis has been observed most frequently among robust individuals, who displayed health and strength during many months of trench service. Tuberculosis in these cases is a disease of waste. These patients ought to be considered as much direct victims of the war as their wounded comrades. When Landouzy spoke of soldiers being "wounded by tuberculosis" (*Blessés de la tuberculose*), he was not trying to coin a smart expression, but he merely stated the truth about the condition of such individuals.



Among those patients who were considered to be cured before the war, only a small number became affected with war tuberculosis. The *good cures*, that is men suffering from a small localized inactive lesion, served many months in the trenches before they actually became tubercular. In the *bad cures*, that is those individuals of weak nature who were affected with what we might call potential tuberculosis, the activity of their lesions flared up in the barracks, just as it would have done in peace time. They never were sent into active service.

C. F. ARROYO.

KOBER, G. M.: Occupation in Relation to Tuberculosis. *Public Health Reports*, March 26, 1920, xxxv, No. 13, pp. 751-770.

There has been much interest recently in industrial medicine and hygiene; however, it was observed by Hippocrates and Galen that certain occupations were dangerous to health. The first systematic treatise or discussion of occupation was written by Prof. Bernardo Ramazzini of Padua in 1700.

A large proportion of persons exposed to infection with the tubercle bacillus do not develop the disease. In addition to the germ there must be suitable soil—a previous illness, hurry, worry, chronic fatigue, loss of sleep, dissipation, inadequate food, insanitary home, lack of pure air, etc.

Predisposition, shown by a delicate physique, narrow chest, and general vulnerability of tissues, may be inherited or the resistance may be lowered by indoor life, dusty occupation, exposure to dampness, extremes of heat or cold, sudden change of temperature, or industrial poisons.

Whether or not indoor work predisposes to tuberculosis, depends most especially upon the ventilation and air supply. Bad effects may also come because the worker is compelled to labor in a stooped position, such as a tailor, engraver, watch maker, metal grinder, shoe maker, etc.

Occupational mortality statistics from the U. S. for 1909 show that the mortality from tuberculosis in agricultural pursuits was 8.7 per cent; among book-keepers and accountants, 22.5 per cent; and among servants and waiters, 27.4 per cent. Other factors besides

the occupation's being in or out of doors are important as is shown by the fact that in Government officials and bankers the mortality from tuberculosis is less than 8.7 per cent, while in draymen, hackmen, and teamsters it is 23.4 per cent.

Hoffman estimates that about 4,000,000 American workers are exposed to excessive amounts of atmospheric impurities. It has been shown by experiment that only a small amount of dust ordinarily reaches the lungs. Most of it is mixed with mucus and saliva and is swallowed. When the quantity is excessive, it does reach the lungs in sufficient quantities to be harmful, producing "pulmonary fibrosis". The degree of injury depends upon the character of the dust. Sharp angular particles of metallic or mineral dust, especially dust containing silicon, are much more injurious than organic dust. It has been pointed out by Collis that dusts are more injurious, if they differ in their chemical composition from elements of the body. This may be the reason that lime dust, plaster of Paris, and cement dust are comparatively innocuous. Indeed, statistics show a surprisingly low mortality from tuberculosis in these industries.

In studying the mortality of those exposed to various kinds of dust—municipal, general, organic, vegetable fiber, animal and mixed fiber, mineral and metallic—it is seen that not only is there a variation in mortality from tuberculosis in these groups, ranging from 30.3 per cent in those exposed to metallic dust to 23.8 per cent in those exposed to municipal dust, but that there is also so great a variation in different groups of workers among those exposed to the same kind of dust (12.9 per cent among street cleaners compared with 25 per cent in street car workers and 22 per cent in coachmen—all exposed to municipal dust) that there are obviously other factors beside exposure to dust which must be considered. Such factors may be physique, standards of living, alcohol, lead, mercury and other industrial poisons. With this idea in mind, the author prepared tables showing the percentage distribution of pulmonary tuberculosis in certain occupations in an ascending scale—not according to exposure to different varieties of dust.

The first table shows a range from 5.6 per cent in lumbermen and raftmen to 9.9 per cent in merchants and dealers. It indicates that tuberculosis is infrequent in occupations involving out-door life combined with muscular activity. It is also infrequent in bankers

(5.9 per cent), physicians (6.6 per cent), clergymen (6.6 per cent), lawyers (7.5 per cent), etc., presumably because of higher standards of living.

In the second table there is a range from 10 per cent in commercial travelers to 14.5 per cent in agricultural laborers. This last figure is high in comparison with people in other agricultural pursuits (6.6 per cent) and it may be accounted for by the lower standards of living. In Table III the range is from 15 per cent in male teachers and college professors to 19.9 per cent in day laborers. In female college professors and teachers the percentage is 21.5 per cent, and these individuals are usually from weak stock. Several other tables are given which show the influence of alcoholic, lead, and mercury poisoning, etc.; they bring out very strikingly the large number of factors that must be considered in assigning the cause of a high mortality from tuberculosis in any occupation.

J. B. NEAL.

VAN HOOGENHUIJZE, C. J. C.: Concerning the Etiology of the Spanish Grip (Zur Aetiologie der spanischen Grippe). *Centralblatt für Bakteriologie*, Feb., 1920, lxxxiv, Part 1, p. 88.

The blood of 35 "Spanish influenza" patients was cultured on many different kinds of media. Plates containing  $1\frac{1}{2}$  c. c. of the patient's blood and 7 c. c. of nutrient agar, uniformly produced very tiny colonies, extremely difficult to see. Occasionally Loeffler's coagulated serum, inoculated with the patient's blood, also gave a growth; all the other culture media which was tried, remained sterile. Thirty-three of the thirty-five blood cultures were positive, some as early as the second day of the disease. After convalescence, the blood cultures once more became negative.

The organism recovered was a very small, thick bacillus, occasionally granular or striated. It is non-motile and non-sporebearing; it does not ferment any sugar, nor form indol, nor bring about any change in milk. It is usually, but inconstantly, gram-negative. It refuses to grow at room temperature; cultures die out very readily. After the organism has passed several generations on Loeffler's coagulated serum, it will grow on plain nutrient agar, assuming, at first, a more slender, markedly beaded or striated form, but resumi-

ing later its original appearance as on blood agar. When inoculated into blood broth or sterile saliva, it appears as a bipolar staining bacillus, resembling *Bacillus pestis*, except that it is smaller. This form is like the bipolar rods so often observed in the sputum of influenza patients.

The serum of 66 influenza patients in every instance agglutinated this organism in dilutions ranging from 1 to 100 to 1 to 800. The serum from 130 patients suffering from febrile diseases other than influenza, failed to agglutinate; nor did blood culture on any such patients yield an organism similar to the one described.

Cultures of this bacillus failed to kill any of the small laboratory animals. Injections into guinea pigs made them ill, with a marked febrile reaction. Inoculations into humans were not made.

A. H. EGGERTH.

TURNER, C. E.: Organizing an Industry to Combat Influenza. *Journal of Industrial Hygiene*, Jan., 1920, i, Part 9, p. 448.

During the epidemic of influenza in the fall of 1918 the writer, who is Sanitary Engineer for District No. 1 of the Emergency Fleet Corporation had supervision of the 20 shipyards located between Groton, Conn., and Eastport, Maine. These yards employed a total of 40,000 men and varied in size from yards constructing wooden ships and having only 150 men, to the Fore River Steel Shipyard at Quincy which employed 15,000 men.

The first knowledge of the presence of influenza in Boston was received September 10, 1918. The disease was spreading fast, for the later statistics showed the chief period of the epidemic was from September 15, 1918 to November 1, 1918. Although the warning was late, it was possible to institute precautionary measures before the epidemic arrived in all yards, beginning with those nearest Boston.

The following is a brief outline of the general program:

- (1) The general manager of each plant was warned of the danger by telephone or by telegraph. A confirming letter outlining the situation and the steps necessary for its control followed.

- (2) The industrial physician in each plant was given all available facts as to the nature of the disease, its treatment, the clinical



appearance of cases in Boston and the advisability of prompt isolation and bedside precautions.

(3) A special coöperating organization was created in each yard: (a) physician and nurse in first-aid room; (b) foremen in the yard who were instructed by printed directions prepared by the sanitary engineer and distributed with the added authority of the yard management. The sample message follows: "Influenza spreading from Boston. Sure to reach Groten. Symptoms: coughing, sneezing, headache, fever, general soreness. Some cases sure to appear in shipyard. We must prevent spread to other men. Ask you to help by watching men and sending any with symptoms at once to Yard hospital. Work quietly; do not alarm men."

(4) The coöperation of local, state and federal public health agencies was secured. This used to the best advantage the medical and nursing personnel of both the industry and health agencies.

(5) Posters and signs warning against special dangers of infection were placed at gates for employees. A sample follows: "If you have cold or grippe, report to doctor immediately. Beware of any men coughing or sneezing. When you cough, cover mouth with hand. Avoid public gatherings—theatres, dances, etc. Do not spit on material that must be handled. Get good food and enough sleep."

(6) Hospital and treatment facilities were arranged in advance of the appearance of actual cases. Some barrack or other building on shipyard property was transformed into an emergency hospital.

(7) The use of common drinking cups was discontinued in all yards and individual paper drinking cups together with special sanitary distributing buckets were supplied when no sanitary drinking fountains were available.

(8) Complete scalding of all dishes in restaurants, hotels and barracks was required.

(9) Special supervision over those who worked with the food was instituted with examinations twice daily so that no person touching the food for shipyard workers could continue work with the slightest symptoms of the disease.

(10) Educational pamphlets on influenza were distributed to all men in yards.

(11) Influenza vaccine was supplied to all doctors who desired to use it.

(12) Daily reports of cases in the yards were received at the

Boston office so that the sanitary engineer could know the conditions in all parts of the district by telephoning to Boston from any yard where he was working.

(13) At the end of the first week a second message was sent to the foremen as follows: "Do not relax your vigilance for influenza. In all yards those crews in which men are sent to the hospital upon first symptoms have few cases. In crews where sick men are allowed to work nearly all get the grippe. It is up to you to keep the yard from being tied up. We rely upon you."

(14) Later, follow-up posters were used such as the following: "What follows influenza? You are in danger until completely cured. While your cough continues, even though you feel well, there is danger from a relapse, pneumonia, colds and tuberculosis. Treat your cough until cured. Get a doctor's advice for any ill effects of influenza. Don't rely upon yourself. After work, when wet and exposed, get a dry rub with a rough towel. Put on dry clothes and footwear. Don't let others cough or sneeze in your face. Avoid getting chilled. Dress warmly. Get plenty of sleep. Eat clean, wholesome food. Your body is the most important machine you have to take care of. Don't neglect it."

No shipyard escaped without a few cases at least. On the other hand it does not appear that many men became infected during working hours. In only one instance did a large number of men from the same working group go on the sick list at approximately the same time. This was in a small wooden shipyard under the supervision of a thoroughly competent physician. The infection occurred during the necessary two days' absence of the physician. A man in the air-compressor room was in the first stages of severe influenza. Nearly all the men who had to go into this room during the day developed influenza later. In general, the foremen accepted the responsibility placed upon them and erred in the right direction by sending too many rather than too few suspects to the doctor for examination.

At some of the yards the physicians sent home all suspicious cases, telling them to report at the hospital next morning if they felt fit for work. In any case the men were to report back to the hospital before reëntering the yard. This is probably the proper system in a disease so difficult to diagnose as influenza and so infectious in the early stages. It is also believed that the successful use

lation of several of those who worked with the food, at a time when premonitory symptoms appeared first, prevented the infection of a large number of men.

In 75 per cent of the yards there was an increase in the number of absentees during the influenza period. In the three yards most affected, absence due to influenza reached 10 per cent of the working force. Death records were kept carefully in only eleven yards, employing 24,350 men. Among these men 85 died of influenza between September 15, 1918 and March 1, 1919—a rate of 3.49 per 1000. The death-rate in Eastern cities, as given by the U. S. Public Health Service for the same period was 5.6 per 1000.

It seems, therefore, that life is saved and efficiency is promoted by impressing upon the men the seriousness of the disease and the need of prompt, continued and suitable treatment. At the same time the men should be allowed to see that they are safer from infection when at work than anywhere else.

B. VON H. ANTHONY.

PARK, W. H.: Bacteriology of Recent Pandemic Influenza and Complicating Infections. *The Journal of the American Medical Association*, Aug. 2, 1919, lxxiii, 318.

When the recent outbreak of influenza first appeared in Europe, it was assumed by all that it was due probably to the same cause as the epidemic of 1889. Two years after that outbreak, Pfeiffer had isolated the influenza bacillus from epidemic cases of influenza-like infections. He had established a relationship between the bacillus and infections of the respiratory tract and had assumed that the bacillus was the primary agent of the great pandemic. Investigations since then have thrown considerable doubt however on this assumption. Many workers have come to consider the bacillus as only one of several varieties of bacteria which have a selective tendency to attack the mucus membrane of the upper respiratory tract.

In the recent epidemic, conflicting reports from different investigations in Europe have been met. In some localities the influenza bacilli were found to be present in nearly every case, while in others bacteriologists isolated them from only a small number of patients.

Instead, pneumococci, streptococci and gram-negative micrococci were found. Frequently, several varieties occurred together. A few observations in France and England indicated that a filterable virus was present in some of the cases, at least. However, as a filterable virus had already been demonstrated in outbreaks of common colds when no epidemic existed, the information in spite of its great interest added simply one more line of investigation.

*Necessary Proof.*—To identify a microorganism as the cause of a widespread epidemic, the germ must be:

- (1) Capable of producing the type of disease under investigation.
- (2) Present in the advancing area in all cases at the beginning of the infection.
- (3) Have the same characteristic when freshly isolated from different patients in any outbreak.

The repeated transfer from patient to patient allows the most characteristic forms to increase so that, until an epidemic is on the wane, we find that isolations from different cases from different localities are practically identical.

Even well trained bacteriologists frequently fail to realize that an epidemic strain is alike everywhere in cases belonging to the epidemic.

Epidemic influenza is a disease attacking primarily the respiratory passages. The symptoms in life and the lesions in the dead, although fairly distinctive at the height of the epidemic, are by no means those which occur after the epidemic has passed. Whatever the primary infecting organism may be, there is no doubt that in most cases other pathogenic bacteria are decisively associated and produce very similar symptoms and lesions. It is perfectly possible that any one of these bacterial varieties may have increased in virulence to such an extent that it is able to initiate an epidemic. The real cause of the epidemic may be either a microbe hitherto unknown or a new and more virulent strain of some known organism. If we assume the latter alternative, we have a difficult problem in obtaining proof, for we must discover how to identify the organism as a new strain.

Suppose that we had found pneumococci in all cases, but that in some we had isolated Type I and in some only Type II. Instead



of this being evidence for a pandemic pneumococcus strain, it would be just the opposite, for two different strains cannot be responsible for one epidemic. For one purpose, the two types are as distinct as if they were diphtheria and tubercle bacilli; if either is the pandemic strain, it must occur in all cases.

Suppose we find a Type II pneumococcus in every case. This is very suggestive, but it is really no proof, unless we can show some peculiarity different from that organism in the cases of respiratory infections before the epidemic. Because of the lack of this evidence, Pfeiffer made his hasty conclusion.

The most delicate test that we have for identity of strains, is that animals injected with them produce identical antibodies. For this reason the resemblance between the agglutinins produced is usually selected as the best evidence of identity or dissimilarity. With the filterable viruses we have to depend upon finding some susceptible animal or revert to human volunteers. If successful in producing infection, we must test specific immunity.

#### RESULT OF RECENT INVESTIGATIONS

*First Naval District, Chelsea, Mass.*—Keegan made cultures from 23 cases and found influenza bacilli in 19. In some of these no other bacteria were found. In 4 of his cases he considered a hemolytic streptococcus to be the dominant organism; in 7, the influenza bacillus. The earlier the cultures were taken, the greater the percentage of influenza bacilli.

Spooner, Scott and Heath found evidence that the cases reacted to the influenza invasion by the production of antibodies. At the end of the first week, enough agglutinins appeared in the blood to agglutinate influenza bacilli in a 1-50 dilution of the serum. In five weeks, the serum of some cases caused agglutination when used in a dilution of 1-800. These workers found no evidence of different strains of influenza bacilli, but did not use the more delicate and accurate absorption method in their tests.

The investigations afforded evidence that in an extensive outbreak, the influenza bacilli played an important part either as the primary agent or as a secondary invader. In 4 cases a hemolytic streptococcus played a decisive part.

*Central West.*—Opie, Freeman, Blake, Small and Rivers ex-

examined 23 cases of acute influenza in the early stage and obtained influenza bacilli from all. Sixty-nine cases of pneumonia were also examined and influenza bacilli were found in 43. Pneumococci were found in every case but were of different types. These workers agree with Keegan as to the etiologic importance of the influenza bacillus in this epidemic. They place the sequence of events as follows: At the time of infection, *Bacillus influenzae* descends into the bronchi; later, pneumococci may invade the inflamed bronchi, enter the lung and produce either lobar pneumonia or bronchopneumonia. Hemolytic streptococci may descend at any time and infect the lung.

Although Keegan, Opie and their associates believe that influenza bacilli are the causative agent, they present no real evidence. Opie demonstrated that in some groups of healthy soldiers, 50 per cent could be shown to harbor influenza bacilli. No proof was obtained that these bacilli differed in any way from those isolated from the patients. Their evidence indicates that the bacilli are as much secondary invaders as primary ones.

In 278 cases occurring in New York, Williams found influenza bacilli as shown in Table I.

TABLE I.—EXAMINATION FOR INFLUENZA BACILLI

<i>Group</i>	<i>Influenza Bacilli Percent Present</i>
Hospital Cases	80
Marines*	100
Home for children	98
<i>Material Examined</i>	
Lungs	80†
Tracheas	96
Heart's Blood	10

\*The Marines came from different vessels.

†17 per cent in pure cultures.

It was found important that the best site for the material be selected; also the use of the best mediums and long training in the study of influenza colonies were especial factors in finding the bacilli.

In 100 cases, among civil and soldier patients in Chicago, Nazam, Pilot, Stungl and Bones found the results given in Table II.

TABLE II.—BACTERIA FROM SPUTUM, NASOPHARYNX AND TONSILS

	<i>Pneu.</i> Per Cent.	<i>B. Infl.</i> Per Cent.	<i>Str. Hemol.</i> Per Cent.	<i>Mic. Cat.</i> Per Cent.
Washed bronchial sputum	70	4	20	5
Cultures from nasopharynx	38	0	7	5
Cultures from tonsils	74	0	37	7

Five healthy persons volunteered to be inoculated in the nostrils with the filtrate from infected mucus. A slight coryza in one and a moderate attack in another resulted. The workers think that the results are insufficient to indicate the pandemic to be due to a filterable virus. They believe that in their cases, pneumococci of unusual virulence were the most important early secondary invaders. Influenzae bacilli were less important than any other bacteria.

A careful survey of the literature leaves the same impression as that given by the brief summary of the few representative investigations above. There is no proof that any one given, is present in all cases. The influenza bacillus leads, partly from its historical importance, and partly because failure to find it does not indicate its absence, for it requires much training to isolate it from a mixture of other bacteria. If isolations from a number of cases proved to have identical characteristics, the probability that the influenza bacillus was the cause of the epidemic would be great; if many strains were found, it would be slight.

Williams and the author decided, therefore, to test the immunological reactions of isolations from more than 100 cases. They tested, also, great numbers of isolations from a few cases. It was found that from the same case, all, or the majority of isolations, were identical in their reactions. The majority of isolations from different cases, however, differed from each other either completely or essentially. The results seemed to show that influenzae bacilli, like pneumococci, have, through the years, altered gradually on the mucus membrane of healthy carriers, into many strains. Although these have many essential characteristics in common, they are different in their susceptibility to specific immune substances and perhaps in other reactions.

During the work it was found that when a plate culture is made from material containing several strains, apparently pure colonies

yield not infrequently two different strains. The resulting mixed culture agglutinated with each of the two serums. Further plating of the culture may fail to separate the strains. If, however, the culture is shaken thoroughly before plating, pure cultures of each strain can usually be isolated.

An important point to be proved was whether or not the infective strain produced the majority of the colonies. If it did, isolations from plates made from the nasopharyngeal material could be considered as belonging to the infective strain. One of the workers developed an acute bronchitis. Cultures revealed abundant influenza bacilli. Fifty fishings of colonies from the plates were found, when tested, to give forty-nine identical organisms and one belonging to a different strain. Another bacteriologist received, by accident, an infection from a freshly isolated culture. About thirty colonies were fished from the plate cultures and all proved to have identical characteristics.

It is considered that an infective strain is in great excess during an infection; that in nearly every case the colony tested will represent the infective strain. Proof that patients are infected by different strains indicates almost certainly that the bacilli were present before and that some other virus created conditions which permitted the latent bacilli to attack the tissues.

The results from the cases studied throw the influenza bacilli clearly into the ranks of secondary invaders. Other microorganisms, such as certain streptococci and pneumococci under suspicion in different localities, will fall in the same category, if they are subjected to similar severe tests.

The pandemic is over. The difficulty of being certain that the present suspected cases are due to the pandemic virus is gradually increasing. We must wait for another pandemic to solve the problem of the real cause which has not yet been identified.

J. B. NEAL.



## SECTION ON LABORATORY AND RESEARCH

FEARON, W. A.: (a) A Modified Kjeldahl Method for the Estimation of Nitrogen. (b) The Carbazol Test for Nitrites. (c) A Color Test for Tryptophan in the Urine. *The Dublin Journal of Medical Science*, March, 1920, Series IV, No. 1, p. 28.

The most important alterations in the original technic of the Kjeldahl method made by Fearon concerned incineration. He found that a mixture of sulphuric and phosphoric acids gave a much better result than sulphuric acid alone. The following mixture is recommended: Sulphuric acid, 100 c. c. (3.38 fluid ounces); phosphoric acid, 200 c. c. (2.53 fluid ounces); copper sulphate, 5 grams (77.16 grains). The mixture is best made by dissolving the phosphoric acid and the copper sulphate in the minimum amount of water, and then adding the sulphuric acid.

The amount required for incineration will depend very much upon the material under examination. Generally from two to three times its volume will be sufficient. It is very important that the sulphuric acid be carefully controlled by blank experiments.

Concerning distillation for extensive work, the steam method is the most satisfactory. Rapid estimates can be carried out very well by the Cole method of distilling with alcohol.

For titrations, methyl red, 0.1 per cent, was found to be a very good indicator. Provided that the alkali is free from carbonates and bicarbonates, the change is quite sharp.

*Carbazol Test for Nitrites.*—To a few c. c. of strong sulphuric acid in a test-tube a very small quantity of carbazol is added and shaken well. If the sulphuric acid is pure, no color change will be observed. Then, on adding a drop of urine, if nitrates are present, a deep green color will develop. The test is extraordinarily sen-

sitive and will show nitrites to the extent of about one part in half a million.

*Detection of Tryptophan in the Urine.*—The ordinary color tests for tryptophan are found to be inapplicable to urine, on account of the other indol bodies present. But tryptophan is able to condense with glyoxylic acid in the presence of sulphuric acid and gives a body very similar to carbazol. This body produces a green nitroso derivative like that of carbazol, but hydrolyzes on dilution with water. Consequently, if urine containing tryptophan is treated with an excess of the glyoxylic acid reagent and a drop is added to strong sulphuric acid, the tryptophan condensation body interacts with the nitrites of the urine to give a deep green color. This result is not given by indol or skatol.

G. A. DISTLER.

CLELAND, J. B.: Concentric Bodies, Probably of Parasitic Origin, in the Australian Sea Mullet, *Mugil Dibulla*. *The Journal of Parasitology*, 1919, vi, 102.

Lesions composed of small, scattered, granular areas, were found distributed throughout the muscle of the mullet. Microscopical examination showed the areas to be composed of concentrically arranged groups of cells, having an appearance somewhat similar to the cell-nests in squamous epithelioma of man. No parasitic bodies of any kind were identified and no explanation of the growth can be given at present.

L. H. GREGORY.

KASAI AND KOBAYASHI: The Stomach Spirochete Occurring in Mammals. *The Journal of Parasitology*, Sept., 1919, vi, 1.

Examination of various types of small mammals showed that a spirochete was present in the stomachs of those animals which wander from place to place, eating whatever food they happen to find. That is, all monkeys and adult dogs and cats examined gave positive results, while young dogs and cats, mice, guinea pigs, rabbits, white and wild rats and moles were practically free from the parasite.

The spirochete, which is an inflexible spiral with a straight longitudinal axis and a flagellum at each end, stains easily with a basic stain or iron hematoxylin. It is found in no other region of the alimentary tract and chiefly in the fundic end of the stomach. It is destroyed when treated outside of the body with bile, sodium taurochocolate and saponin, or when subjected to putrification. Salvarsan introduced into the stomach easily kills the organism.

The spirochete is readily transmitted to the stomach of a rat or mouse, but with difficulty to that of a normal rabbit or guinea pig unless the vitality of the animal is lowered by some infection. That is, if the host is normal, no pathological results follow, but if the spirochete-bearing rabbit is inoculated with the *virus fixe* of rabies, there is an enormous increase in the number of parasites, and definite lesions develop which differ from any pathological conditions resulting from the virus alone. Similar results were gained from experiments with guinea pigs previously infected with scarlet fever or measles. This leads to the conclusion that the cases of hemorrhagic gastro-enteritis are due probably to the secondary pathogenicity of the spirochete.

L. H. GREGORY.

PIRERA, A.: A New Method for Determining the Borders of the Viscera—Especially the Heart—by Means of Auscultatory Friction. *Gazetta Medica Napoletana*, Oct., 1919, ii, No. 10: reported in *La Presse Medicale*, Apr. 14, 1920, xxviii, No. 22, p. 219.

Auscultatory percussion is a valuable diagnostic aid in determining the borders of the organs. But, unfortunately, vibrations from the neighboring tissues tend greatly to limit the value of this method, if the percussion be forceful. If the percussion is light, deep organs cannot be outlined by this method.

The author uses light friction instead of percussion. A given area is lightly scratched with the point of the index finger, while the bell of the stethoscope is held at a predetermined point. The friction movements should not exceed  $1\frac{1}{2}$  cm. in amplitude. By this method, light vibrations are obtained which vary in quality, intensity and pitch, so that the ear can exactly demarcate by changes in the vibrations the borders of any organ studies.

The vibrations are of a definite character, when the skin over the body of an organ is scratched. When the border is reached, there is a slight change, and when the organ's limits have been passed, there is a marked change in the character of the vibrations.

To outline the heart, the uncovered area is first determined by ordinary percussion. Then the bell of the stethoscope is placed over the four-inch left intercostal space, at the sternum, and the skin is scratched in radiating lines from the borders previously noted. It is possible to definitely delimit the cardiac area, and the vascular area. The vibrations obtained from the latter are distinctly different from those obtained by friction over the former. The author's findings, by this method, have always been controlled by the use of the orthodiascope, and have always been confirmed.

S. KAHN.

MEUNIER, L.: Topographic Diagnosis of Ulceration of the Digestive Tract. *La Presse médicale*, May 8, 1920, xxviii, No. 29, pp. 283-284.

The presence of blood in the intestinal canal results from an ulceration in some part of the canal.

(1) EXAMINATION FOR BLOOD IN THE DIGESTIVE TRACT.—Often, when a clinical diagnosis of ulcer has been made, the usual chemical tests for detecting blood in the stomach contents and feces are negative. This is not due to an insufficient sensitiveness of the reagents, but to the fact that fresh blood does not exist as such in the intestinal canal; it exists as hematin, unless there is profuse hemorrhage. Besides, there is always associated an inflammation of the mucosa around the ulcer, which results in a secretion of mucosa, which encapsulates the hematin. Both hematin and mucus are insoluble in water and in the aqueous acid solution existing in the stomach. For this reason, the usual examinations for blood are often negative.

But both mucus and hematin are soluble in aqueous ammoniacal solutions, and by the use of such solutions, blood is frequently detected when previous examinations were negative. The patient is put on a milk and vegetable diet for two days. At the end of that



time, 200 c. c. (6.66 fluid-ounces) of water with 10 drops of ammonium hydroxide are passed into the stomach by tube. Some of this solution is immediately withdrawn. The rest is allowed to remain in order to react upon the mucus and to dissolve the hematin. Then the following examinations are made:—

(a) *Gastric Contents*.—A few cubic centimeters are withdrawn and treated with the ordinary reagents of Mayer or Thevenon. The characteristic color appears, if blood is present.

(b) *Feces*.—The patient is given three tablespoonsful of powdered charcoal in water immediately after the ammonia solution is passed into the stomach. The solution of hematin in the stomach mixes with the charcoal, which acts as an indicator. On this charcoal, passed about twenty-four hours later, the usual tests for blood are made.

(2) **DIAGNOSIS OF ULCERATION OF STOMACH**.—To make this diagnosis, a positive reaction obtained with the extracted ammoniacal solution is sufficient. The author obtained positive tests in 20 per cent of his cases, and believes that all gastric pain is due to a break in the continuity of the mucosa.

(3) **DIAGNOSIS OF ULCERATION OF DUODENUM**.—With a reaction for blood that is negative in the stomach contents, and positive in the feces, the author concludes that a duodenal ulceration is present.

(4) **DIAGNOSIS OF ULCERATION OF THE INTESTINE, EITHER HIGH UP OR LOW DOWN IN THE CANAL**.—Blood from the rectum or sigmoid appears in the feces as hemoglobin and not hematin. Hemoglobin being soluble in water, blood from the lower bowel can be detected by treating the feces with filtered water and testing it with the ordinary reagents. If the blood comes from higher up, the watery extract will give a negative reaction, because such blood is in the form of hematin. In such cases, the feces mixed with an ammoniacal solution, which dissolves the hematin, will give a positive reaction.

(5) **DIAGNOSIS BETWEEN ULCER AND CANCER**.—Frequent examinations of the stomach contents are made for eight days, while the patient is in bed. If the reaction becomes negative for blood before eight days have passed, the lesion is probably an ulcer. If the reaction is persistently positive longer than eight days the patient probably has a cancer.

S. KAHN.

MOORE, B.: The Balance of Colloid and Crystalloid in Cholera, Shock, and Allied Conditions. *British Medical Journal*, Oct. 18, 1919, No. 3068, 490.

The French school has found that, in anaphylaxis, hypertonic saline solutions inhibit hemolysis, either in a natural hemolytic system, or in an actively created one, with a specific hemolysin as in the Bordet-Gengou reaction and the Wassermann test. The cause of these phenomena is a disturbance of the equilibrium between the colloids of the blood and cells, and the crystalloids, existing united, or absorbed in common solution or in suspension. In shock, due to hemorrhage or surgical injury, salines given alone, are rapidly eliminated, but gum acacia, or gelatin, serve to anchor the crystalloids and preserve the equilibrium of salt and colloid in the blood and fixed cells. In cholera the balance is upset in the other direction and hypertonic salines are very effective, because they fix the colloid toxin, and are excreted by the intestine and kidney. A similar explanation is given for the prevention of anaphylactic shock, only here the colloid fixed by the saline is a lecithin. This union between colloid and crystalloid is very slight; it is a molecular union; and there are no atomic linkages. It resembles the union of salts to their water of crystallization. The union is, however, definite, and without it life, as it now exists, would be impossible.

L. C. JOHNSON.

ASHE, J. S.: Ovarian Insufficiency as a Probable Cause of Epilepsy. *The Dublin Journal of Medical Science*, May, 1920, Series iv, No. 3, p. 142.

Because of his gynecological experiments, the author believes that an association exists between ovarian insufficiency and epilepsy. He has tried to evolve the deduction that the toxin which acts as a predisposing factor in some cases of epilepsy is produced by (a) absence of, diminution or change in the ovarian ferments leading to (b) some multiple functional deficiency of the endocrine organs which upsets the hormone balance, and produces further toxins which act on the cerebral cortex, causing epilepsy in some cases.

G. A. DISTLER.

SYNGE, V. M.: The Influence of Salts and Other Substances on Agglutination. *Dublin Journal of Medical Science*, Feb., 1920, No. 578, p. 76.

As the result of his own experiments and the work of Friedberger, Synge has reached certain conclusions which are at variance with those of Bordet, to the effect that the influence of certain substances on agglutination is purely ionic. The investigations of Bordet brought him to the conclusion that the rôle of the salt was purely physical and fundamentally the same as the coagulation of milk and the adhesion of small particles of clay to one another, which occurs when the relations of molecular attractions are altered by the presence of an ionising salt. On the other hand, Synge, from his work, finds that all non-ionising substances, such as asparagin, are capable of bringing about agglutination with the aid of specific serum.

G. A. DISTLER.

NAKAGAWA, K.: Further Notes on the Study of the Human Lung Distome, *Paragonimus Westermanii*. *The Journal of Parasitology*, 1919, vi, 39.

In Melania, a river snail, cercariæ have been identified; they are undoubtedly related to the human lung distome. Miyairi reports that he has obtained the same species of cercariæ experimentally by infecting the snails with the miracidia of the human lung parasite. Identical cercariæ have been found in the muscle and skin of the river crabs, showing that the snails and crabs may be the intermediate hosts in the life history of the lung parasite.

L. H. GREGORY.

MASOIN, P.: The Diazo-reaction in Epilepsy. *Bulletin de l'Académie royale de médecine de Belgique*, July 26, 1919, xxix, No. 6, pp. 982-995.

Masoin observed a positive diazo-reaction in several epileptics, occurring at the time of the attacks. He considers this an evidence of some general disturbance, which is shown in a disturbed urinary

elimination, especially of nitrogen. This leads Masoin to the belief that certain forms of epilepsy are a result of a state of auto-intoxication.

Death followed in 20 out of 29 cases in which the reaction was positive and in only 3 out of 26 cases in which there was a negative diazo-reaction. This lends some prognostic significance to the author's work.

S. KAHN.

ROGERS, J. B.: Further Observations on Artificial Tuberculous Infection of Guinea Pigs Through the Respiratory Route. *Abstracts of American Review of Tuberculosis*, Feb., 1920, iii, No. 12, p. 750.

A single spraying of five minute's duration with a suspension of tuberculous sputum, produced pulmonary tuberculosis in 100 per cent of guinea pigs when they were exposed to the spray. The tubercles became visible in the lungs microscopically on the seventh day at which time the tracheo-bronchial glands showed distinct involvement. After the eighteenth day, tubercles were frequently found in the liver and in the spleen. Microscopically, after twenty-four hours, localized interstitial tissue infiltrations were found and after forty-eight hours the infiltration became generalized. On the eleventh day, large consolidated areas were present. Inoculation experiments showed that when the guinea pigs were kept in a spray of tuberculous sputum for five minutes, tubercle bacilli were present in the lungs fifteen minutes later. When sputum containing tubercle bacilli was placed on a normal nasal mucous membrane, the bacilli passed through the membrane without leaving a trace of entrance and lodged in the cervical lymphatics, which always showed tuberculous changes. The lungs liver and spleen became involved later.

Since guinea pigs are very susceptible, the animals must be examined early in the course of the experiments, when they are made, with the object of showing the first pathological changes. Coughing tuberculous patients frequently emit infectious particles of sputum, and if inhaled by persons in close proximity to the patient, they become an active source for the transmission of the tubercle bacillus from one individual to another. Such particles



coughed out by patients were caught on sterile Petri dishes, and in three out of ten experiments the washings from the plates were infectious for guinea pigs.

C. A. SCHMID.

SANDS, J. E.: A Comparative Study of Methods for the Preparation of Typhoid Agglutinogens. *The Journal of Immunology*, March, 1920, v, No. 2, p. 97.

A comparative study of agglutinogens prepared from a single strain of typhoid bacilli which had been used for agglutination tests for several years, was made by comparing their susceptibility to specific agglutination by rabbit immune sera, their tendency to spontaneous agglutination, their qualities of keeping well and their susceptibility to contamination.

The density of the agglutininogen was found to have an important influence, regardless of the method of preparation; thick suspensions obscured results and reactions, while very thin suspensions were difficult to read with the naked eye. The density of a particular agglutininogen should be adjusted according to the diameter of the test tubes employed and to the total volume of fluid. Suspensions in saline solution of microörganisms washed from solid media were generally superior to broth cultures.

The best saline solutions for the preparation of agglutinogens were found to be those containing 0.85 to 1 per cent chemically pure sodium chlorid in distilled water.

Distilled water alone was found unsatisfactory for the preparation of typhoid agglutininogen.

Heating an agglutininogen at 60° C. (140° F.) for two hours generally increased its susceptibility to specific agglutinins.

Agglutinogens prepared without preservatives, with the exception of those preserved with formalin, were generally superior to those containing phenol, tricresol, mercurphen, and glycerin.

The best agglutinogens were found to be those containing 1 to 2 per cent formalin.

The addition of more than 0.5 per cent phenol and tricresol to an agglutininogen reduced its susceptibility to specific serum agglutinins; addition of glycerin reduced susceptibility to specific agglutination.

An agglutinin of typhoid bacilli is best prepared by cultivation on solid media for forty-eight hours, removing the growths with 0.85 to 1 per cent chemically pure sodium chlorid in distilled water, shaking with beads until a perfectly homogenous emulsion is secured, diluting with saline solution to proper density (about 2,000,000,000 per cubic centimeter) and adding neutral formalin to 1 per cent.

W. LINTZ.

BENNETSON, L. A.: The Weil-Felix Reaction as a Laboratory Test in the Diagnosis of Typhus Fever. *Public Health Reports*, Oct. 31, 1919, xxxiv, No. 44, pp. 2446-2454.

The reaction is analogous to the Widal test in typhoid. It consists in the agglutination by the patient's serum of a *Proteus*-like organism X<sub>2</sub> and X<sub>19</sub> which were isolated by Weil and Felix. X<sub>2</sub> being isolated from the urine of a case clinically diagnosed as typhus. It is a short, thin, gram-negative rod resembling, in many of its cultural characteristics, *Proteus vulgaris*. This organism has not been shown to be etiologically concerned in the disease, but it was isolated from the blood and urine of typhus patients forty-four times from several hundreds of cases. Weil and Felix ascribe the agglutinating power of the serum to the presence of the organism as a secondary invader. It appears during the first week of the disease but it is at its height during the second week and during convalescence. It is present in a large percentage of cases, in 63 out of 65 according to Fairley; while out of 120 non-typhus cases, no positive agglutination was obtained in a dilution of 1 to 20. According to Weil and Felix it was positive in 125 out of 126 cases diagnosed as clinically typhus, while in 632 control sera from many other diseases, about 12 per cent showed positive reactions in a dilution of 1 to 25, but in practically all these cases the agglutination was delayed or incomplete. In positive cases the agglutination titer should run from 1 to 25 on the sixth day; to 1 to 200, 1 to 500 or higher on the twelfth day. If the titer is 1 to 25 in the first test and does not rise higher, typhus may usually be excluded. In addition to the live cultures, killed culture antigen may be used and also an alcoholic preparation of antigen, which is said to keep for two years. The test sometimes fails, according to Weil and Felix, in mild or very

severe cases. Its early appearance and comparative constancy make the reaction of great value as a laboratory aid in the diagnosis of typhus, especially in view of the fact that no other laboratory method has been discovered aside from animal inoculation.

J. B. NEAL.

SARTORY, A., AND FLAMENT, L.: Bacteriological Study of Powdered Eggs (Etude bacteriologique des poudres d'oeufs). *Bulletin de l'Académie de médecine*, Paris, Jan. 6, 1920, lxxxiii, 46.

The bacteriological research carried on by both authors has shown that desiccated eggs could be considered a perfect food, if it were not for the ease with which the product can be contaminated by slight moisture. The samples examined by the authors presented great amounts of aërobic microörganisms, but none of the germs was anaërobic. They classified the microbes observed in two groups: (1) Micrococci; and (2) Bacilli. In the first group they include two varieties similar to *Staphylococcus citreus* and to the *micrococcus* of the lactic ferments respectively, and two other varieties whose biological characteristics are similar to those of the *Enterococcus*. In the second group they found the *Bacillus subtilis*, a variety belonging to the group of the *Bacillus coli* and another bacillus that presents active proteolytic and saccharolytic functions different from those of the *Bacillus coli*.

The authors believe that the contamination takes place during the preparation of the product for commercial purposes. The product can be used without danger in the making of omelets and other dishes which must be cooked, for this operation suffices to sterilize the food, but it is dangerous to use the egg powder for such dishes as ice cream where no heat is employed during the process of manufacture.

C. F. ARROYO.

BURGET, G. E.: Note on the Flora of the Stomach. *Journal of Bacteriology*, 1920, v, 299-303.

The flora of the stomach has been the subject of numerous investigations, but the findings have not been uniform. Burget has

studied the flora of a patient who had a complete closure of the esophagus and a gastric fistula. The fistula is of long-standing and does not interfere with the patient's general health. The usual source of contamination from swallowed food was eliminated. Two or three hundred cubic centimeters of sterile water were injected into the stomach three or four hours after a light meal to carry off the food residuum. A sample of the psychic secretion was withdrawn one hour later. The free and total acidity was determined immediately and plates were made at once. Only one hour later those specimens were considered which were clear and showed a free acidity varying between 0.15 and 0.25 per cent and total acidity between 0.20 and 0.37 per cent. All specimens of normal acidity showed practically the same group of organisms. If the acidity was below normal, many organisms were present. The count on glucose agar plates shortly after collection varied from 25,000 to 100,000.

Most organisms were found in small numbers except one yeast which seemed to thrive in the gastric juice. There were three chromogenic organisms which were common, but they were no more resistant than the non-chromogenic organisms which were found. The findings indicate that the flora of the empty stomach are fairly constant. In clear specimens of normal acidity the number of different organisms found is few and they are unrelated, making it impossible to classify them into groups. Extracts with an acidity above or below that of the normal extract have a higher bacterial content and a greater variety of organisms. From this one case the following organisms were isolated: two yeasts, two coccus forms, a bacillus, *Sarcina flava*, the Boas Oppler bacillus and a short bacillus with some coccus forms.

F. HULTON-FRANKEL.

COHEN, S. J.: Protein Fever. The Effect of Egg White Injection on the Dog. *The Journal of Laboratory and Clinical Medicine*, Feb., 1920, v, No. 5, p. 285. •

Owing to the report of several investigators that repeated parenteral injections of a protein produce a continued fever, the author gives the following report from his investigations with the guinea pig and the dog:



He found that repeated subcutaneous injections of egg white into guinea pigs produce a constant fever, associated with most of the signs of infection. But with the dog repeated subcutaneous injections of egg white do not affect the temperature curve and do not produce fever. The author is unable to explain the reason for this.

The egg white is absorbed from the place of injection, because the lump disappears within a few minutes. The idea that the egg white is excreted without being broken down can be disproved by the fact that the urine does not contain albumin. If excreted from the bowel, it seems that there might be some intestinal disturbance, either a diarrhea or a severe constipation, but neither of these factors were present. The dog's temperature is more constant than the guinea pig's. But even this does not explain the wide differences of reaction in the two animals. However, what becomes of the egg white should be determined. Is it changed in the blood or in the tissues, or is it eliminated through the liver into the intestines, and there digested and absorbed? These matters can be decided by sensitizing guinea pigs with the blood and bile of dogs which have recently received subcutaneous injections of egg white.

C. M. ANDERSON.

MANN, F. C., FOSTER, J. P., AND BRIMHALL, S. D.: The Relationship of the Common Bile-duct to the Pancreatic Duct in Common Domestic and Laboratory Animals. *The Journal of Laboratory and Clinical Medicine*, Jan., 1920, v, No. 4, p. 203.

In studying the function of the gall-bladder, it seemed desirable to know whether there is any particular relationship between the common bile-duct and the pancreatic duct in species of animals with a gall-bladder, as compared with species without a gall-bladder. In reference to the relationship of the common bile-duct and the pancreatic duct, three were recognized:

- (1) Both ducts enter the duodenum at separate openings.
- (2) The two ducts are distinct, but have a common entrance into the duodenum.
- (3) The pancreatic duct empties directly into the common bile-duct, usually at quite a distance from the opening of the latter into the duodenum.

The important points to consider in the relation of the comparative anatomy of these ducts to their comparative physiology and pathology are: (a) the presence or absence of a gall-bladder; (b) the relationship of the point of entrance of the duct to the pylorus; and (c) the presence or absence of a tendency to develop pancreatitis.

The comparative study of fifteen species gave the following data: There does not seem to be any relationship between the comparative anatomy of the biliary and pancreatic ducts and pancreatitis. No reason for the relationship of the two ducts in the different groups was found. No definite connection between the presence or absence of the gall-bladder and the relationship of the two ducts could be established.

C. M. ANDERSON.

JAMIESON, G. J.: The Determination of Saccharin in Urine. *Journal of Biological Chemistry*, 1920, xli, No. 3, p. 102.

This article describes a method of analysis for saccharin in urines: The urine is treated with lead acetate solution and is filtered. After acidification with HCl, the saccharin is extracted with ether, the ether being removed by evaporation and the saccharin finally extracted from the residue by ether. This second ether extract is reduced to a residue by evaporation and fused with sodium carbonate and the sulphur determined as barium sulphate. The amount of saccharin is calculated from the sulphur found after correction for the blank. Experimental results with urines to which saccharin was added in known amounts indicate the reliability of the test, if the methods described are accurately followed.

W. H. EDDY.

ERVIN, D. M.: 1. The Relation of Glycogen to the Pathological Changes in Pancreatic Diabetes. *The Journal of Laboratory and Clinical Medicine*, Dec., 1919, v, No. 3, p. 147.

In a previous article, the conclusion was reached that the pancreatic state of diabetes is a condition where, by failure of the pancreatic internal secretion, glucose is not built rapidly enough into

glycogen. By failure to synthesize glucose into glycogen and thereby remove the glucose from the blood, there results a hyperglycemia and a glycosuria. In this article Ervin offers evidence that this absence of glycogen in the tissues, accounts for the associated pathologic changes of diabetes, such as fatty degeneration and acetonuria.

Glycogen is a stabilizing colloid in the cell and as such prevents the breaking of the emulsion or fatty degeneration by its resistance to acids, salts, etc. This condition exists as long as glycogen is present, but when the glycogen is hydrolyzed by acids, the protein fat cell breaks easily into edematous protein and free fat.

In diabetes no glycogen is formed, the fat is only slightly emulsified, permitting a high concentration of the fats or soaps to reach the cell and producing limited oxidation with acetone bodies.

Various poisons, phosphorus, arsenic, mercury, chloroform, produce a fatty liver, and in every instance such a liver is glycogen free. This condition is also true in pancreatic extirpation. Glycogen, when fed, prevents a fatty liver. In poisoning, when acids are formed, the glycogen is hydrolyzed, which causes a separation of the protein-fat emulsion, or system, that remains. While glycogen is present, the system protein-glycogen-fat is broken by acid only with difficulty, and glycogen is maintained in the system by carbohydrate feeding. Glycogen is maintained in the system, or cell, only when the equation, glucose glycogen, takes place in a medium of right reaction; such a reaction cannot be acid. In the treatment of poisoning from mercury, from chloroform, etc., the patient should first be alkalized to make it possible for the reaction to go from glucose to glycogen; then he should be fed on sufficient carbohydrates to furnish glucose from which to build a stable protein-glucogen-fat system.

Acetonuria consists in reality not in a failure in oxidation, as we have been accustomed to think, but in their oxidation of too great a quantity of fat, permitting the formation of such a high concentration of intermediate compound, e. g., acetone, etc., that, while a portion is turned completely to  $\text{CO}_2$ , another portion passes out through the kidney.

The equilibrium of glycogen with glucose is shifted toward the glucose side by the presence of the hydrogen ion, which is the explanation of the high blood sugars in fever, mercury and phosphorus poisoning, and nephritis.

C. M. ANDERSON.

LILLY, T. E.: An Experience with the Schick Test and Toxin-antitoxin, and a Plea for their Use in the Extinction of Diphtheria. *Boston Medical and Surgical Journal*, Jan. 29, 1920, clxxxii, No. 5, p. 110.

In June, 1915, an outbreak of diphtheria occurred in the State Industrial School for Boys in Massachusetts. The usual methods: taking cultures of the inmates of the infected cottages, quarantine of all persons with positive throats and passive immunization of the inhabitants, were successful for a time, but did not eradicate the disease. Finally the New York City Health Department furnished a toxin-antitoxin with the understanding that it was to be given only to boys showing a positive Schick reaction. The number given the test was 257, with 148 positive reactions. Ninety-eight of these were given 1 c. c. of toxin-antitoxin at intervals of seven days. Two months later a second Schick test was tried on all immunized subjects. Of 98 only 28 showed a slight reaction after seventy-two hours. Three months later 94 were again given the Schick test; at the end of seventy-two hours, only 6 showed a slight reaction. From four years' experience the author concludes that:

(1) In institutions where diphtheria has been prevalent for some time, taking cultures, except in cases of sore throat, is practically useless.

(2) A non-virulent bacillus is often found to be persistent in the throats of so-called chronic diphtheria carriers.

(3) Repeated passive immunization with diphtheria antitoxin does not protect and such immunization lasts less than three weeks.

(4) Toxin-antitoxin does give absolute immunity when more than a month has elapsed after its administration. It causes no troublesome reaction, and the immunity persists indefinitely.

(5) Toxin-antitoxin has no curative powers and does not immediately protect against diphtheria. In clinical cases large doses of antitoxin should be used instead of toxin-antitoxin for both patients and contacts.

(6) The Schick test is not rapid enough to be of immediate use in cases of clinical diphtheria, but should be used to separate immunes from non-immunes.

(7) The Schick test should be used in schools, camps, institutions and communities where diphtheria persists.



During four years' experience more than 1,000 have been given the Schick test after periods of immunization varying from three months to three years, and practically all gave negative reactions.

M. M. BANOWITCH.

FERRY, N. S., AND HOUGHTON, E. M.: Some Suggestive Experiments with *Bacillus influenzae*: Its Toxin and Antitoxin. A Preliminary Report. *Journal of Immunology*, 1919, iv, 233.

Corroborating the work of Julia T. Parker, the authors were able to produce a soluble toxin in broth cultures of *Bacillus influenzae* from which an antitoxic serum was obtained by injections into a horse. This immune horse serum neutralized the soluble poison referred to and in two series of experiments it protected guinea pigs against two and three lethal doses of the live Pfeiffer bacillus.

A. F. COCA.

HUNTOON, F. M., AND HANNUM, S.: The Rôle of *Bacillus influenzae* in Clinical Influenza. *Journal of Immunology*, 1919, iv, 167.

These authors studied the toxic products of *Bacillus influenzae* and investigated, with the aid of serological methods (agglutination), the question of the identity of the different strains of this organism.

Extracts of the bacteria were toxic and, injected by the peritoneal route, they always produced pulmonary and pleural lesions. These poisonous extracts were specifically detoxicated with a "polyvalent" immune serum prepared by injecting the bacteria into a horse.

Broth horse-blood vitamin cultures of the organism alone were not toxic in a dose of 1.0 c. c. (16 minims) when injected into mice; but when to this culture *Streptococcus hemolyticus* was added, a poisonous filtrate was obtained which was detoxicated with the immune serum referred to.

The filtrate from a pure streptococcus culture was much less toxic than that from the symbiotic culture.

Symbiotic growth of *Bacillus influenzae* with pneumococcus produced no poisonous filtrate. This difference is explained by the fact that when grown with streptococcus, *Bacillus influenzae* is almost com-

pletely disintegrated; whereas, with pneumococcus, the organism remains intact. The poison resulting from the symbiotic growth with streptococcus thus represents substances derived from the bodies of the bacteria (endotoxins).

In confirmation of the experiments of Julia T. Parker, the authors obtained a toxic filtrate from pure broth rabbit-blood cultures of *Bacillus influenzae*, which killed rabbits in a dose of 4 c. c. (.1 1/16 fluidrams) and which was detoxicated with the immune serum referred to above. Guinea pigs and rabbits which had been injected with the filtrate became immune to ordinarily lethal doses of the filtrate and also of the live bacilli.

A study of a polyvalent immune horse serum showed that, in every instance, the absorption of the serum with one strain of *Bacillus influenzae* caused a reduction of the titer of the serum for all the other strains tested. The authors found "no strains among (their) collection which do not show relationship, either directly or indirectly, through absorption".

These results contradict those reported later by Parker (*Jour. Immunol.*, 1919, iv, 351) and by Valentine and Cooper (*Jour. Immunol.*, 1919, iv, 359).

Huntoon and Hannum observed that animals (mice, guinea pigs and rabbits) which had received injections of "influenza toxin", were susceptible to natural pulmonary infections (with streptococcus and pneumococcus). Furthermore, guinea pigs which had received injections of the poison of *Bacillus influenzae*, or the killed bodies of these bacteria, were easily infected with streptococcus and live *Bacillus influenzae* which were suspended artificially in the air.

A. F. COCA.

MATSUNAMI, T.: Studies on the Meningococcidal Activity of Blood.

*The Journal of Immunology*, Jan., 1920, v, No. 1, p. 51.

It has been found by the pipet method that normal rabbit blood and serum are capable of killing considerable numbers of virulent normal meningococci *in vitro* within three hours. The meningococcidal activity *in vitro* of normal rabbit blood was found to be increased up to a certain limit by the intravenous injection of the living and autolyzed meningococci. After that, further immunization

did not appear to increase the bactericidal activity, which was generally rather irregular; not infrequently it actually decreased the meningococcidal activity of the blood. The more highly immunized rabbit's blood was found sometimes to be less bactericidal than the slightly immunized rabbit's blood. The Meningococcidal activity of normal rabbit's serum has been found not to be increased by artificial immunization and also to be comparable with that of defibrinated blood of an immune rabbit.

The meningococcidal activity *in vitro* of immune rabbit's blood was found by the pipet method to be distinctly stronger than that of the serum of defibrinated blood or of blood consisting of blood-cells and serum or of citrated blood. It was suspected that at least one factor in explaining the higher meningococcidal activity *in vitro* of immune rabbit's blood compared with defibrinated blood, citrated blood and serum, lies in the influence of the coagulation of the blood. This is permitted in the regular blood test as described, and favors the phagocytosis of meningococci.

The meningococcidal blood test cannot be accepted on the basis of the present investigation for the purpose of measuring or determining the artificially induced immunity against meningococci.

However, as pointed out by Dr. Heist, the bactericidal blood test possesses the advantage of employing whole blood; hence when this method is used by any mechanism of immunity existing in the blood, it may be brought into direct relation with the microorganism. Moreover, in this test any anti-bactericidal factors existing in the blood, and the influence of individual variation of the fluid constituent, upon the bactericidal activity of the blood, as well as phagocytes in blood, have equal chance to come into play. Furthermore, it was found that a parallelism between the bactericidal activity of the blood and resistance to certain bacteria including meningococci, exists under normal conditions. Therefore, the bactericidal blood test described may be regarded as a method possessing definite value for measuring the natural resistance of the organism for certain microorganisms. This might be especially true for meningococci, inasmuch as, with respect to meningococci, no accurate method sufficiently reliable to serve as a definite measure of antibody content has yet been devised for measuring immunity to this microorganism.

W. LINTZ.

BLAIVAS, A. J.: A Comparative Study of the Wassermann Test and the Hecht-Weinberg-Gradwohl Modification. *The Journal of Laboratory and Clinical Medicine*, Jan., 1920, v, No. 4, p. 244.

The author gives a detailed account of the technic used in the Hecht-Weinberg-Gradwohl modification, and concludes:

(1) In sixty-five per cent of the sera the Wassermann and the Hecht-Weinberg-Gradwohl tests were either positive or negative in both cases.

(2) Nineteen per cent of the sera showed a borderline or positive in the Hecht-Weinberg-Gradwohl test and a one-plus or borderline in the Wassermann reaction.

(3) Seventeen per cent had no hemolytic index. (Of course in these cases the H-W-G test could not be employed).

(4) Five per cent showed a strong positive with the H-W-G test and a negative in the Wassermann.

(5) Five per cent showed a positive in tubes 12 and 13 in the H-W-G and a negative in the Wassermann.

(6) Four per cent showed a positive in tube 13 and a negative in the Wassermann. Two per cent showed very doubtful reactions.

(8) Our average hemolytic index was four, not including those sera that had no index at all.

C. M. ANDERSON.

SCHOENFELD, W.: The Mastiche Reaction (Emanuel) and its Relation to Other Reactions in the Spinal Fluid (Über die Mastixreaktion (Emanuel's) und ihre Stellung zu anderen Reaktionen in der Rückenmarksflassigkeit). *Münchener medizinische Wochenschrift*, April 23, 1920, No. 17, p. 482.

Three hundred and forty fluids were examined by the Mastiche (Emanuel) reaction and compared with the Wassermann, Nonne (Phase 1 reaction), and the Pandys carbolic test. In order of sensitiveness the Wassermann ranked first, the Nonne second, the Mastiche third, and the Pandy test fourth. The conclusion was that Emanuel's Mastiche reaction presents no particular advantage in the examination of spinal fluids.

H. JOACHIM.



## SECTION ON PEDIATRICS

DUMOUTET: A Case of Nondiphtheritic Pseudomembranous Rhinitis. *Archives de médecine des Enfants*, Paris, April, 1920, xxiii, No. 4, p. 245.

Dumoutet reports a case of false membrane leaving a bleeding surface which appeared first on the right tonsil and spread to the nasal mucous membrane. Clinically the case was not diphtheria and smears of the membrane showed the presence of fusiform bacilli and spirillæ. He advises applications of novoarsenobenzol as the treatment.

W. C. DAVISON.

NUZUM, F.: Eosinophilous Myocarditis in Diphtheria. *The Journal of the American Medical Association*, Dec. 26, 1919, lxxiii, No. 26, p. 1925.

Nuzum studied histologically the hearts of children who had died of diphtheria and found marked eosinophilia in 7 of 29 cases examined. This, and other changes were most marked in the perivascular areas. He also noted some swelling of the bundle of His and other conduction structures. Sinophilia was demonstrated after death from other infectious diseases. It bears no relation to the intensity of the infection nor to the amount of antitoxin administered. He suggests that compression of the bundle of His may explain the arrhythmia often seen in diphtheria. He thinks that the eosinophilia is the result of positive chemotaxis.

H. G. WEBSTER.

TALBOT, F. B.: The Caloric Requirements of Normal Infants and Children from Birth to Puberty. *American Journal of Diseases of Children*, Oct., 1919, xviii, No. 4, p. 229.

A series of 108 boys and 70 girls, the majority being normal breast-fed infants, as well as normal children up to puberty, were studied with reference to their caloric requirements. Six charts with explanatory notes are given:

Chart I shows the total basal metabolism, for twenty-four hours, of normal children from birth to puberty. Up to the age of six months, the total metabolism is slightly more than double the basal metabolism, whereas after six months, the doubling of the latter more than gives the total metabolism. Basal metabolism of boys is slightly greater than that of girls, between 10 kilograms and 34 kilograms; over 34 kilograms the basal metabolism of girls is somewhat greater.

Chart II gives the actual basal metabolism of infants from birth to one year; it also gives the approximate curves showing weight, food consumption and available food. The relative number of calories lost in excreta, used for growth, and used for energy, is represented. The total of these added to the basal equals the total calories ingested. The average increase of metabolism over basal metabolism, due to muscular activity, is estimated at 25 per cent. Since growth increases 100 per cent during the first six months of life, and 50 per cent during the second six months of life, it is estimated that 36 per cent of the food consumed is used for growth at three months, 26 per cent at six months, and 21 per cent at nine months.

Charts III, IV, V, and VI are hypothetical representations of the effects of diminished food-supply, of diarrhea, of fever, and of excessive muscular activity, respectively, on growth.

T. B. GIVAN.

ABT, I. A.: A Case of Hanot's Cirrhosis in a Two-year Old Child. *Medical Clinics of North America*, July, 1919, iii, 13.

The patient, two years old, had had symptoms of hypertrophic cirrhosis of the liver for five months—emaciation, progressive icterus, low fever (100° F.). The liver was palpable from five to six inches below the costal margin. The spleen was enlarged and mov-

able. The urine showed bile but no other abnormalities. The blood gave a moderate secondary anemia with slight increase in polymorphonuclears (78 per cent) and total leukocytes (16,000). All clinical laboratory tests were negative. The stools were dry, but contained bile. Both liver and spleen were hard and smooth in outline. During five months' observation the general condition has increased and the liver has steadily enlarged. The history, both family and personal, shows nothing of significance. After detailing the symptomatology of all the diseases of the liver and spleen, Dr. Abt concludes that the case is Hanot's Cirrhosis. He suggests an infection of unknown origin as the cause of the disease. The course of the disease is chronic over a period of years; there are frequent febrile crises, and death is usually due to intercurrent disease.

H. G. WEBSTER.

PRICE, W. H.: Dried Milk Powder in Infant Feeding. *Public Health Reports*, April 2, 1920, xxxv, No. 14, pp. 809-828.

In view of the fact that dry milk powder is growing in favor for household use and for infant feeding, many laboratory workers have experimented on animals and The Boston Baby Hygiene Association has gone so far as to supervise the feeding of babies with it.

The dietary properties of whole dry milk are the same in essentials as are those of whole milk. The value of reconstructed milk which consists of skimmed dry milk and unsalted butter is also given:

	<i>Fat</i>	<i>Sugar</i>	<i>Protein</i>
Whole Milk:	4%	4.8%	3.18%
Whole Dry Milk:	4%	5.7%	3.71%
Reconstructed Milk	4%	5.1%	3.1 %

The antiscorbutic vitamin of raw milk is known to be very low and Chick and Hume contend that this vitamin is entirely destroyed in the dry milk, while Hess and Unger believe that the antiscorbutic value of dry milk depends largely upon the method of manufacture. There is no reason to doubt that there is also a difference in the brands of dry milk.

In almost all diets of infants who are being fed artificially, it is considered necessary to give an antiscorbutic vitamin, preferably orange juice.

According to McCollum, while dry milk has lost none of the antiscorbutic vitamin contained in cow's milk, a considerable decrease was found when the dry milk was heated in a double boiler for four hours.

The babies feeding on dry whole milk and on reconstructed milk had a greater average gain per baby per day than those feeding on whole milk (Grade A).

Although gain in weight does not conclusively mean that the food is essentially adequate for infant feeding, the work done would seem to indicate that whole milk powder and reconstructed milk are useful and safe and possibly advantageous in infant feeding.

There are two important factors in the variation of the antiscorbutic value of dried milk powders: (1) The freshness of the milk before drying and the method of drying; and (2) the element of time between drying and consumption. It is known that the antiscorbutic value is lost by heat and age.

J. B. NEAL.

DIBLE, J. H.: Streptococcal Ulcerative Endocarditis of the Aortic Valves Occurring in an Infant Aged Six Months. *Journal of Pathology and Bacteriology*, 1920, xxiii, 196-199.

Ulcerative endocarditis, though common in adults, is seldom met with in an infant. The child was admitted to the hospital, at the age of six months, with crusted impetiginous sores on the head and upper part of the body. The infant was also suffering from diarrhea and vomiting. Three weeks later the sores had disappeared under treatment and the diarrhea and vomiting had ceased, with a decided improvement in the general condition. The child continued to improve until the twenty-seventh day in the hospital, when the temperature, which had previously been normal, began to rise. The temperature oscillated for six days between 102° F. (38.89° C.) and normal, until the seventh day, when the child died. The autopsy showed the presence of bronchopneumonic consolidation of the lower lobes of both lungs, and an enlarged spleen, which was somewhat soft



but not diffuent. The kidneys showed numerous well-marked miliary infarets of recent data, some of which contained suppurative centers. The heart weighed 30 grams; its external surface and the pericardium were normal. On slitting up the cavities, it was found that the posterior cusps of the aortic valve showed recent, acute, ragged, friable granulations situated somewhat below the line of contact of the cusps. A similar patch of granulation was present on the wall of the ventricular septum below the valve. The affected cusp was found to be perforated and the interventricular septum nearly so, the process having reached as far as the endocardium of the right ventricle, but not having perforated it. The other valves and cavities of the heart were healthy. None of the other organs obtainable showed anything worthy of note. The organisms could not be isolated, as the organs had been immersed in formalin, but the streptococcus was found on histological examination. The case is interesting on account of the early age at which the infection was found and the acute course which the disease took. It was assumed that the infection of the valves took place while the child was in the hospital, and that the disease lasted only eight days. The infection was clinically unconnected with the gastro-intestinal disturbances for which the child was admitted to the hospital. The case does not correspond to the rheumatic endocarditis of childhood but rather to the virulent form of adult life. The path of entry of the organism was most probably by way of the spots on the body, as streptococci are frequently found associated with a condition of this sort. This might also account for the development of the heart condition after entrance to the hospital, as there would probably be a short latent period between the time of entry of the organism and the development of the heart condition.

F. HULTON-FRANKEL.

SMITH, R. M.: A Health Study of a Boy's School. *American Journal of Diseases of Children*, Oct., 1919, xviii, 246.

The author calls attention to the proper correlation of health and education in school children. This should be in main in schools where the several authorities are able to come into closest contact with the child. The present methods of safeguarding their health

are inadequate, in that the school authorities have not received the proper instruction from the physicians who are interested in child welfare. There must be a readjustment of the entire school program, whereby a child may have the school hours divided into four periods, balancing the hours according to the age and the general condition of the child. These periods are termed: study, active, inactive, and occupation periods. By obtaining the coöperation of the parents, the program can be satisfactorily carried out. The author gives a detailed description of the results obtained during the past five years in Mr. River's Open Air School for Boys in Boston. On admission each boy brings a medical chart from his family physician, which is submitted to an advisory medical committee, which in turn considers his medical résumé in outlining his curriculum, diet, rest periods, etc. A school matron keeps a daily record of each pupil, charting absences and their causes, condition of weather, and so on. By such observations, uniform standards of school health supervision may be estimated and put into effect.

T. B. GIVAN.

REH, T.: Two Neurological Types of Influenza (Grip). *Archives de médecine des enfants*, Paris, 1920, xxiii, 363.

The symptoms of the first patient, a girl of seven years, closely simulated those of tubercular meningitis: There were typical spinal fluid changes (increased globulin and lymphocytes); and emaciation and enlarged bronchial glands. The child's condition and the spinal fluid gradually returned to normal. The second patient, a girl of seven years, during the course of influenza (grip) developed a violent delirium, and lapsed into an ataxic state, symptoms suggestive of cerebellar involvement, but the child recovered completely.

W. C. DAVISON.

SECTION ON  
ROENTGENOLOGY AND ELECTRO-  
THERAPEUTICS

A COLLECTED ABSTRACT OF THE LITERATURE ON  
ROENTGENOLOGY FOR THE YEAR 1919

By I. SETH HIRSCH

ORGANS OF DIGESTION (GASTRO-INTESTINAL TRACT)

*(Continued from page 773)*

Dr. P. M. Aime and Dr. J. Solomon, in an article on "The Radiological Diagnosis of Transdiaphragmatic Hernia of the Stomach Resulting from War Wounds (*American Journal of Roentgenology*, August, 1919, vi, 376) state that transdiaphragmatic hernia of the stomach is by no means as rare as it was before the late war. This is due to the large number of injuries to the diaphragm which have been produced and also to the fact that the condition is more frequently detected, thanks to the more extensive use of the roentgenological examination in gastro-intestinal disturbances.

The difference between the intra-abdominal and intrathoracic pressures during a strong inspiration or a fit of coughing is sufficient to cause the passage of the abdominal viscera, into the thoracic cavity, to a certain extent, whenever the dome of the diaphragm presents a break in its normal continuity, either of congenital or traumatic origin. Of all the abdominal viscera, the stomach is the organ most frequently associated with hernia. A certain number of cases have been reported in which the hernia involved the transverse colon, or even the spleen. Before the common use of the roentgenological method of exploration, the transdiaphragmatic hernias were almost always discovered only at autopsy. The clinical signs described by Patel and Jaboulay are dyspeptic symptoms, vomiting, borborygmus, and gurgling with auscultation. These symptoms are usually vague or incomplete, and the authors state that a number of the diaphragm-

atic hernias have no clinical history but are merely autopsy findings. This is because they have no special characteristics; their existence is very rarely suspected, except in the presence of well-marked accidents.

The term hernia is not absolutely correct, for no actual hernia sac exists. For this reason the term "transdiaphragmatic intrapleural evisceration" is preferable.

The authors believe that wounds of the diaphragm do not have any tendency toward spontaneous healing. The usual clinical methods of investigation are not capable of definitely revealing a diaphragmatic hernia, and it is essential to employ the roentgenological examination in every case of wound of the thorax accompanied by digestive disturbances.

In a reported case the wound extended from below upward; there was a diaphragmatic hernia of the spleen and stomach, which led to death in fifteen hours. In another case a diaphragmatic hernia of the stomach itself, followed a wound extending from above downward and resulted in death in forty-eight hours. In a third instance, a diaphragmatic hernia of the transverse colon led to death by strangulation of the hernia an entire year after the wound. The hernia had not been recognized.

Although formerly of fairly frequent occurrence, pyopneumothorax subphrenicus is becoming less common as gastric conditions and appendicitis (the two chief sources whence it arises) receive their proper surgical treatment. It can hardly occur, except in the case of a surgically neglected patient such as the subject of the report given by Sherwood Moore (The Roentgenological Findings in a Case of Pyopneumothorax Subphrenicus Dexter. *The American Journal of Roentgenology*, February, 1919, vi, 83).

The patient was five years old; he suffered from pain in the back and had a history of an attack of vomiting four weeks previously, followed by pain in the abdomen, right side and back, with fever. Fever and pain continued, accompanied by wasting and an increasingly bad general condition. A physical examination was unsatisfactory and inconclusive, and the patient was referred to the roentgen-ray department to have a roentgenogram of his chest taken, and was ordered to report the following day. The roentgen examination made in the prone position showed the heart apparently displaced to the left, slight scoliosis (convexity to the left), the lung-fields clear, and the



diaphragm disproportionately high on the right side. Below the latter there was a clear, gas-filled triangular space, with the greatest side somewhat concave, directed downward and inward, the lowest point being level with the tip of the eleventh rib. From this lowest point a narrow, gas-filled space extended toward the iliac fossa.

Fluoroscopic examination showed (erect position) the right leaf of the diaphragm immobile, and the excursion of the leaf increased. Below the diaphragm on the right side was a reniform, clear, gas-filled space, the lower pole of which was cut off by a definite, horizontal straight line. This line remained horizontal when the child bent over laterally, and wave motion was elicited by shaking the patient. The postero-anterior view corroborated these findings. Examinations made with the patient in a supine posture showed the same conditions as in the erect posture, except that there was less clarity over the area noted above. The shape of the clear area changed from reniform to triangular. From the lowest point of this triangle, a narrow, gas-filled space extended downward and inward toward the pelvis. Roentgenograms were made from these two angles.

These findings warranted the roentgenological diagnosis of a gas-containing subphrenic abscess, probably originating in the appendix. Aspiration was performed, and a small amount of pus withdrawn for examination. It contained many streptococci and colon bacilli, and presented the general characteristics of pus from a chronic walled-off abscess.

Incision and drainage evacuated a large amount of foul pus, gas, and an enterolith. A large cavity was found, extending upward from the right iliac fossa. Investigation of the lesion was precluded by the patient's condition.

A roentgenological examination made forty days after operation gave approximately the same findings as those found earlier except that no collection of fluid was present.

### *Salient Features of Roentgen-ray Findings*

(1) The presence of a collection of gas beneath the right leaf of the diaphragm, the outline of which is modified by change of posture. The definite outlining of the peritoneal reflection composing the right lateral ligament of the liver, proves that it, the gas, lies intraperitoneally. The collection, being external to the right lateral

ligament of the liver, eliminates the stomach and duodenum as the source of the affection. This same fact, taken in conjunction with the situation of the collection just beneath the lateral abdominal wall, makes it practically certain that the cecum, the appendix or the ascending colon is the primary seat of disturbance.

(2) The existence of a narrow, gas-filled canal leading toward the pelvis, which implicates the appendix as the origin of the condition.

(3) The relatively large amount of gas and small amount of fluid in the space. The natural inference is that an opening into the intestine has existed, allowing ingress of gas and egress of fluid. This is confirmed later by the development of a fecal fistula.

(4) The absence of infiltration of the adjacent tissues with gas, in contradistinction to the process usually found in gas bacillus infection and traumatic emphysema.

(5) The slow collapse of the cavity after drainage.

(6) The existence of an undamaged lung and diaphragm.

*The Use of Gas Injections for X-ray Examination of Organs in the Peritoneal Cavity.*—The advent of a method of roentgenological examination of the abdomen by the use of gas injection within the peritoneal cavity has aroused much interest, because of the possibility of further progress in the diagnosis of obscure lesions of the abdominal viscera.

Like every new method it is wildly and enthusiastically acclaimed, particularly by those who do not fully appreciate the advances which have already been made in the roentgen diagnosis of abdominal diseases. While it cannot be doubted that the method has its value, it must also be understood that it has distinct limitations. It would appear from some of the comments and quoted reports that by this method it is possible to outline the organs of the abdominal cavity, and that this is absolutely new and cannot be accomplished without this method. This is decidedly erroneous. For instance, the delineation of the kidneys is a matter of every-day routine. The same is true of the spleen—its entire extent may be clearly outlined by the ordinary roentgenological methods. The lower border of the liver may also be readily determined.

The new gas injection method, therefore, has no great practical utility in the determination of these organs. However, if it is considered essential that the organs should be so sharply delineated that

their contours are quite apparent, so that "he who runs may read"—that, of course, is another matter.

On the other hand, the great value of this method lies in the determination of such abdominal tumors as cannot be outlined by the usual roentgenographic methods, for instance, those originating in the aorta, adrenal, uterus and adnexa. It is to be regretted that the pancreas, an organ which cannot be delineated roentgenographically by the ordinary methods, has not as yet been demonstrated by this newer method.

There is a serious doubt whether, with the exception of the pathological conditions of the pelvic viscera, the lesions demonstrated by this method could not have been diagnosed by the usual roentgenographic means.

The method is harmless, particularly when carbondioxid gas is used. In fact, Bastanelli has stated that it is the usual routine in his office procedure to inject a small amount of gas into his patients and then to send them home, after a fluoroscopic examination.

This method is undoubtedly a valuable supplement to the bismuth examination of the gastro-intestinal tract, but cannot replace the latter procedure.

In a preliminary paper, O. Goetze describes (Radiological Diagnosis with a Distended Abdomen. A New Method. *Münchener medizinische Wochenschrift*, November 12, 1918.) the technic and results of a new roentgen-diagnostic procedure consisting in distending the peritoneal cavity with oxygen or atmospheric air. This causes a sort of dissociation of the abdominal viscera, which then becomes accessible to roentgenoscopy and roentgenography. To introduce oxygen, the writer employs a special apparatus or injects the gas through lumbar puncture needles. The point of puncture selected is from 3 to 5 centimeters below the umbilicus in the middle of the left rectus muscle, or below the costal margin outside the area of hepatic dullness. From 2 to 3 liters of oxygen are easily tolerated in all cases. The contra-indications to the procedure are: all the serious disturbances of circulation and respiration, acute or adhesive peritonitis, etc. The gas may be evacuated after roentgenography. There was no change in the temperature or pulse in over 90 cases in which this method was used. The illustrations show peritoneal adhesions, ascites at the beginning, neoplasms of the viscera or abdominal walls, various forms of hernia including diaphragmatic hernia, enlarged mesenteric



lymph-nodes, changes in the abdominal aorta, caries of the spine and pelvic bones, abscess, pericholecystitis, renal calculi, renal changes, splenomegalia, pathologic conditions of the bladder (simultaneous intravesical and abdominal insufflation), growths of the uterus and adnexa, pregnancy, etc., and also indicate the shape of the lower cardiac limits.

A. Shittenhelm (Roentgen Diagnosis with the Aid of Artificial Accumulation of Gas in the Abdominal Cavity [Über Roentgen-diagnostik mit Hilfe künstlicher Gasansammlung in der Bauchhöhle], *Deutsche medizinische Wochenschrift*, Berlin, 1919, xlv, No. 21, p. 566) states that two methods are in use:

(1) Contrast effects are produced by the gaseous expansion of the stomach and intestines. The intestine is filled with gas by means of a rectal rubber tube and the stomach by means of a stomach tube. This method usually gives a clear picture of the position, form and size of the liver, spleen and frequently also of the gall-bladder, as well as of certain tumors. When the results are not satisfactory the second method is used.

(2) The peritoneal cavity is filled with oxygen. The procedure is quite simple in patients with ascites, but patients without ascites present rarely any difficulty. A syringe provided with a fine cannula and filled with a physiological salt solution is cautiously forced through the abdominal covering, the finger resting upon the piston of the syringe. The easy flow of liquid shows that the needle has reached the abdominal cavity. The oxygen is introduced by means of an insufflation apparatus such as is used on pneumothorax therapy. About 2 liters of oxygen are usually sufficient. The patient is examined first lying down and then standing. On rising, the patient frequently experiences pain due to adhesions, especially of the liver. By this method the liver, and especially the spleen, when enlarged, are well outlined. The gall-bladder, however, is not always seen.

Wm. H. Stewart and Arthur Stein, (Roentgen-ray Study of the Abdominal Organs Following Oxygen Inflation of the Peritoneal Cavity. *The American Journal of Roentgenology*, November, 1919, vi, No. 11, p. 533) give a history of the procedure first used in 1910 by Jacobaeus in Stockholm.

In January 1912, Weber, working in the Private Institute for Roentgen Diagnosis of Drs. Eugene Weber and V. von Bergman of



Kies, conceived the idea, based upon the roentgen examination of a bladder filled with oxygen showing an hypertrophied prostate in good detail, that the introduction of sterile inactive oxygen or air into the abdominal cavity might help to render visible a number of organs, tumors, and abdominal areas which heretofore had been more or less inaccessible to the roentgen-ray examination. His roentgenograms showed that the following viscera and areas may be rendered visible by means of gas inflation of the abdomen: the liver and spleen as a whole, including the region of the gall-bladder; coils of the large and small intestines without bismuth filling; the pyloric end of the stomach; the wall of the stomach and large intestines with gas contents; the bladder filled with urine; parts of the mesentery; the subphrenic space, not readily accessible to diagnosis, and many abdominal tumors. Weber emphasized the far-reaching importance of air or oxygen inflation of the abdominal cavity for experimental and diagnostic roentgenology, and laid stress on the value of the method for obtaining good roentgenograms of the liver and biliary region, as well as for the roentgenographic representations of tumor and inflammatory swellings.

The latest contribution to this subject is made by A. Schmidt, who, in February, 1919, published an article confirming the opinion of former authors as to the value of this method.

The authors have examined altogether 37 cases, the results of which investigations have been somewhat startling.

The technic required for the inflation is extremely simple. After the intestinal tract has been thoroughly cleansed and the bladder emptied, the patient is put upon his back. As a rule a point is selected on the anterior abdominal wall about 1 inch to the right or left, and 2 inches below the umbilicus. The skin is thoroughly scrubbed, and sterilized with tincture of iodine. If adhesions are known to be present or an abnormal scar is visible, it is well to avoid this area. After the skin has been anesthetized with an ethyl chlorid spray, an ordinary lumbar puncture needle is placed obliquely downward until it reaches the fascia; the needle is then pushed gently through the fascia muscle and peritoneum into the abdominal cavity. The plug is withdrawn and the needle connected with a rubber tube, the other end of this tube having been previously attached to the outlet of an ordinary oxygen tank. Oxygen is now allowed to flow gently into the peritoneal cavity. Sufficient gas should be used to render the

abdomen dome-shaped in appearance; as a rule about 4 liters are required, the quantity depending largely upon the amount of relaxation of the abdominal walls. In case the pressure from the tank should be too high, the rubber tube will jump from the needle, as the caliber of the needle is very small.

The tube is then disconnected, the needle quickly withdrawn, and the site of the puncture covered with a small piece of adhesive plaster, the entire procedure having been conducted under modern aseptic precautions.

The patient frequently complains of a sense of fullness from the distention, and may have some pain in the shoulders, especially the right, probably caused by pressure on the diaphragm.

The roentgen examination should be made as soon as possible after the inflation, as the patient becomes accustomed to the distention. If a longer interval than an hour is allowed, emphysema is liable to occur, due to the leakage of oxygen through the peritoneal opening into the outlying structures. Such an event renders it difficult to observe the abdominal organs clearly and in detail.

The oxygen is gradually absorbed by the abdominal tissues, disappearing almost completely in from twenty-four to forty-eight hours.

The cardinal point to be constantly borne in mind in making the roentgenographic examination is that the particular organ which is investigated must be placed in the highest plane possible in order that it may be completely surrounded by the gas, and that the intestines, which are freely movable in the presence of oxygen, should be allowed to drop away, thus avoiding conflicting shadows. This applies particularly to the kidneys and uterine appendages.

In order that the best detail of the diaphragm and liver, with the gall-bladder region, the spleen and the glandular enlargements, may be obtained, the patient should lie on his abdomen with the tube above; stereoscopic roentgenograms are made from behind forward.

Further liver and spleen details with excellent kidney outline are obtained by having the patient lie on his side. If the left kidney and spleen are being investigated, the patient lies on his right side, the left being uppermost; the tube is placed in front and the plate properly supported with sand bags behind. If details of the liver and right kidney are sought, the patient lies on his left side, other requirements being the same.

There are two positions for obtaining satisfactory shadows of

the uterus and appendages: the right and left exaggerated lateral Trendelenburg, obtained by placing the patient on his side and elevating his hips on a support about 6 inches high, with the thighs and legs slightly flexed and the shoulders and head low, resting on the table; the tube and plate are in a similar relation to the patient as in the straight lateral position. The other position, which seems to bring out the best detail of the pelvic organs, is obtained by the use of a canvas-top table, one end of which has been elevated about 15 degrees. The patient lies on his abdomen, the head toward the lowest portion of the table; the plate is placed on the back, and properly held in position by sand bags; the tube is beneath, the anode being centered on the promontory of the sacrum. By this method the intestines drop out of the pelvis and are replaced by the oxygen, which surrounds the fixed organs.

Intraperitoneal adhesions are detected by placing the patient on his back; the plate is on one side and the tube on the other.

The two factors which must be considered in the use of this method are the danger of infection and the risk of puncturing the intestines. The first objection may be overcome by the ordinary precautions. As to the second objection, the authors feel that with care there is absolutely no danger of puncturing the intestine.

A. Schmidt (A New Method for Roentgenographic Examination of the Abdominal Organs. *Deutsche medizinische Wochenschrift*, February 20, 1919, xlv, 201. Abstr. in *Medical Record*, May 10, 1919, p. 798) corroborated the results obtained by Goetze by gas insufflation of the peritoneum, and speaks of its value as an aid to roentgen-diagnosis. The procedure is harmless and may be of the greatest utility. Examinations in hepatic and gall-bladder affections give the most satisfactory results. Enlarged spleens show up extremely well. The outline of the stomach, revealed by insufflation of the organ, has permitted the writer to make an early diagnosis of carcinoma of the lesser curvature.

Orndoff (Pneumoperitoneum in X-Ray Diagnosis, *Journal of Roentgenology*, Sept., 1919, ii, No. 3, p. 265.) concludes that:

(1) The procedure for producing pneumoperitoneum is not difficult, and while a few important points in technic are essential, they require no special training other than the usual medical training of a physician.



(2) The size, position, mobility, relative density, variations in density, contour, contents and cavities of the abdominal viscera can be visualized and studied in a manner which opens to physicians entirely new possibilities.

(3) New findings are encountered which seem to invite the conclusion that the basis for possible new clinical disease entities has been established and old clinical entities relegated to obsolete classifications.

(4) Peritoneal adhesions between abdominal viscera and the anterior abdominal wall are demonstrated without difficulty. The importance of the functional pathology originating from this source will be studied carefully by the workers in this branch of medicine.

(5) In 7 cases of fixation of the gastrocolic omentum to the anterior abdominal wall, a cardinal symptom was vomiting, which was temporarily relieved by producing a pneumoperitoneum. The symptom usually returns as the oxygen is absorbed.

(6) Perihepatitis, perisplenitis and pericolicitis with peritoneal adhesions offer new phases for study of the functional pathology of these organs.

(7) After pneumoperitoneum has been produced, valuable aid in diagnosis is offered by filling the colon, stomach, duodenum, small intestines, bladder and pelvis with oxygen. Variation in the diameter of the walls, changes in relative densities, and the presence of neoplasms, are detected before they have reached alarming proportions, and consequently, diagnosis and prognosis is rendered more rational and reliable than has heretofore been possible.

(8) Postoperative peritoneal adhesions to the anterior abdominal wall may be prevented by keeping the peritoneal cavity distended with oxygen for from three to five days, or until the peritoneum is healed.

(To be continued)

JACKSON, C., SPENCER, W. H., AND MANGES, W. F.: The Diagnosis and Localization of Non-opaque Foreign Bodies in the Bronchi. *American Journal of Roentgenology*, June, 1920.

This article deals with the clinical and roentgenological phases of the diagnosis of non-opaque foreign bodies in the bronchi. As such



great importance has been attached to the roentgenographic localization of foreign bodies, the entire scheme seems to be disarranged if the method becomes uncertain and fails to reveal the foreign body.

By the routine examination of hundreds of cases the authors have been able to diagnose non-opaque foreign bodies by physical signs, with a considerable degree of accuracy.

Most of the non-opaque bronchial foreign bodies are of an organic nature, such as nut-kernels, coffee beans, maize, beans, etc. Even composition buttons, celluloid, wood, small bones, teeth and similar objects have often failed to produce distinct shadows on the plate.

The peanut is the most foreign body in the bronchi. There is an inherent irritating quality in nut-kernels which causes a diffuse, edematous, purulent inflammation throughout the lower air passages of young children, from the larynx to the finer bronchi. The inflammation is most intense at the point of lodgment of the kernel, producing ulceration and abscess if the foreign body is not removed.

The term "arachidic bronchitis" is given to this peculiar form of inflammation. The reaction from other organic substances not opaque to the roentgen-rays is much less severe than in the case of those of the arachidic group, and is usually limited to the point of lodgment and adjacent structures.

If the foreign body completely occludes a bronchus, preventing aëration and drainage of the passages below, the reaction will be prompt and intense.

It is of the utmost importance to determine the presence of non-opaque foreign bodies, especially nut-kernels, because they so quickly set up a fatal degree of pathology, in marked contrast to the frequently prolonged symptomless sojourn of metallic foreign bodies. Children under two years of age seem to suffer most. As the ages of four and five are reached the reaction may be localized in the bronchus invaded.

The roentgenographer and the examiner of the chest should consult together and endeavor to correlate their various findings. In order to do his best work the roentgenographer should be familiar with salient points of the history.

A presumptive diagnosis of foreign body in children may be made when the parents state that the child had an object in its mouth and suddenly choked, after which wheezing respiration, paroxysmal coughing, dyspnea and fever developed. Chevalier Jackson first called

attention to the value of wheezing respiration as a diagnostic sign. The wheezing resembles that heard in asthma, but has a drier quality than the latter. The asthmatoïd wheeze is heard most clearly when the air-passages are coughed free from secretion. When a bronchus is completely occluded the asthmatoïd wheeze is absent. The physical examination of the chest for the location of the foreign body shows the unobstructed side to be somewhat fuller. Lessened expansion on the affected side is always noted. The intercostal spaces on the obstructed side will be retracted during inspiration. In fully developed arachidic cases intense rhoneal fremitus will be felt on the free side. Percussion on the obstructed side reveals an impaired resonance associated with drum-like, muffled tympany.

In later stages marked dullness, increasing to flatness toward the base, is made out below the foreign body. This is due to the accumulation of secretions in the air-passages below the obstruction, and has been termed drowned lung by Dr. George O. Johnston. Later, when destruction of tissue occurs and lung abscess forms, the involved area will be denoted by its dull or flat percussion note. The breath sounds are of greatly diminished intensity on the effected side in the earlier stages and are usually absent over an area of drowned lung. On the unobstructed side harsh breathing is heard, which, in the arachidic cases, is accompanied by very loud, snoring, snapping and bubbling râles. In some cases in which the foreign body fails completely to occlude the bronchial lumen, the râles may be most intense over its site of lodgment. Vocal resonance is often little altered. By careful study of the physical signs it can be determined what lobes of the lung are being deprived of air and drainage and from this the almost exact location of the foreign body can be deduced. The case is then referred to the roentgenographer for verification of the findings and for additional information.

The three characteristic roentgen signs found are :

- (1) Increased transparency over the entire affected side.
- (2) Depression of the diaphragm on the affected side.
- (3) Displacement of the heart and mediastinal structures away from the affected side—in short, an acute obstructive emphysema. To this may be added increased density in the lung shadows on the opposite side due to retained secretion.

Upon the examination of many plates, it was found: (1) that these signs were common in the arachidic cases, (2) that they corresponded to the bronchoscopic findings, (3) that for the most part these signs disappeared shortly after the removal of the foreign body. The inflammation in the bronchi at the site of the foreign body is an essential factor in the production of the acute obstructive emphysema; it may be present in other than arachidic cases, providing the foreign body causes sufficient inflammation.

The diagnosis can be made on the basis of the history, clinical findings, and physical signs when properly interpreted, but at times the history is not clear and the physical signs are not easily interpreted. On the other hand, the roentgenographic signs which have been mentioned present no difficulty of interpretation, now that they have been discovered. They are characteristic of foreign body plus inflammation sufficient to block a main bronchus. The author's cases were all in young children, and they are not prepared to say that these signs would be present in older children or adults, because of the larger caliber of the bronchi.

The technic is not unusual. Even a plate blurred by motion, an underexposure or an overexposure will usually show the signs satisfactorily. The exposure should be central and through the median line anteroposteriorly, in order to show the position of the heart and diaphragm. Undue force in restraining the child, sedatives or anesthesia are contra-indicated.

The paper contains 7 case reports of foreign body in children, illustrating the history, clinical and physical, and the roentgenographic findings.

I. S. HIRSCH.

MARIE, P., AND LERI, A.: Lesions of the Vertebrae and Spasmodic or Mental Torticollis. *Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, Mar. 18, 1920, xxxvi, No. 10, p. 359-372.

"Mental torticollis" consists of tonic, clonic, or tonico-clonic contractions of the neck, localized in the sternomastoid muscles, or affecting the neighboring muscles also.

Its nature and pathogenesis are not definitely known. Brissand

believes it to be a tic—purely functional—which at first had a certain purpose, but ultimately became habitual. In his opinion, it is usually associated with a defective mentality—especially with disturbances in volition, attention and emotion. This explains the name *mental torticollis* which he applies to it.

Pitres, Cruchet, and Meige believe that in addition to the cases of torticollis which are dependent upon a defective mentality, there are certain essential cases which are due to some lesion of the muscles, nerves or central nervous system. What these lesions are, is yet unknown.

The authors carefully studied 7 patients who were suffering from so-called mental torticollis. They made x-ray studies of the vertebrae with the following results: In all their cases, roentgenographs showed a lesion in the cervical portion of the vertebral column. Though the lesion resembles that seen in cases of Pott's disease, the authors believe that it is not tuberculous, but chronic rheumatoid in type—*chronic vertebral rheumatism*.

The authors believe, therefore, that spasmodic, or mental torticollis, is often due to lesions of the cervical vertebrae and the necessarily associated nerve irritation.

S. KAHN.

SCHMITT: Radium and X-rays, *Bulletins et mémoires de la Société de médecine de Paris*, Dec. 27, 1919, No. 5.

The author has obtained excellent results in associating radium and roentgentherapy in the treatment of fibroid tumors of the uterus and breast. In the treatment of uterine fibroids, the radium prevents the increase in the hemorrhage which is fairly frequent in the first part of roentgenotherapy. However, when it is employed alone, radium appears to be inferior to the x-rays. In roentgenotherapy, Schmitt uses the multiple portal of entry and cross-fire method and diminishes the risks of radio-dermatitis and at the same time insures deep and intense action.

E. J. SKINNER.



## SECTION ON NEUROLOGY AND PSYCHIATRY

JELGERSMA, G.: The Function of the Cerebellum. *Journal für Psychologie und Neurologie*, 1918, xxiii, 137.

A comparative anatomical description of the brain of cetaceans is here given. Because of the aquatic life of these animals, their central nervous system has undergone a series of very peculiar modifications, especially with reference to the form of the cerebellum and the development of the cerebellipetal and cerebellifugal fiber systems. The hemispheres have attained extreme development, while the vermis is relatively and absolutely reduced in size. In the cerebellipetal system those fibers, which serve for deep sensibility and equilibration tonus, are especially prominent, while skin sensibility, which is reduced in aquatic life, has a relatively unimportant conduction apparatus. Thus those qualities which stand in direct relation to voluntary movement and which are localized in the cerebellum have attained extreme amplification. From this extensive evolution of the cerebellum hemispheres and the paths connected with them in these animals, it may be inferred that the sensory stimuli from the periphery go, principally, over the cerebellum, the direct sensory connection toward the cerebrum over the lemniscus being developed only in a rudimentary manner. The human brain also presents characteristic deviations of development. The enormous size of the hemispheres is due to three factors: the erect position of the body, the evolution of the coördinated movements of speech and facial expressions, and the unsymmetrical [monolateral] movements of the extremities. The speech of adults is controlled more by the cerebellar apparatus than by the acoustic centers, for the act of speech proceeds much more rapidly than it would if it were under the influence of the cortical acoustic sphere. Hearing is, of course, necessary for learning speech,

but after the attainment of a certain skill, a noteworthy reformation takes place and the government of speech by hearing is gradually replaced by regulation from the cerebellum, i. e., by means of deep sensibility. By this means the control is withdrawn from consciousness, because deep sensibility works without consciousness. A like transformation takes place in all higher coördinations, e. g., piano playing, skating, etc. The author emphasizes the anatomical relation of the cerebrum to the cerebellum, one evidence of which is the pathological-anatomical experience that the cerebellar spheres undergo atrophy, if either the terminal or emerging points of the cerebro-cerebellar fibers are affected in the cerebrum. The functions of the cerebellum are summed up as follows: the cerebellum is the center for the coördination of all voluntary movements; these coördinations are brought about by reflex effects from two organs of sense, the equilibration-tonus organ and deep sensibility organ, and conscious sensibility has no participation therein. The cerebellum in man is principally under the influence of the cerebrum, the centripetal stimuli being conducted to the cerebrum and the returning stimuli reaching the periphery partly by way of the cerebellum.

S. E. JELLIFFE.

KLEIN: Concerning Continuous Rhythmic Spasms of the Soft Palate and the Swallowing Musculature. *Monatschrift für Psychiatrie und Neurologie*, 1918, xliii, p. 79.

The pathology of continuous rhythmic twitching of the swallowing musculature is obscure. For the production of this disturbance, four causes are taken into consideration by this writer:

- (1) Direct irritation of the motor nerves.
- (2) A reflex mechanism.
- (3) An hysterical foundation.
- (4) An organic disease of the central nervous system.

The occurrence of these spasms as the result of a disease of the motor nerves cannot be regarded as conclusively proved. There is no doubt, however, that they occur on a reflex basis and they are explained by the following mechanism: The sharply bent course of the tensor around the hamulus pterygoideus favors a passive tension

of the muscle when there is a certain contraction of the antagonists so that the tensor is specially inclined to a reflex clonus. The untiring constancy of the twitching is thus also accounted for. The rhythmic spasms may jump over to the other palatine muscles or to the other side. From this disturbance must be differentiated the continuous rhythmic spasms involving electively the entire swallowing apparatus which also may take place reflexly, but in connection with a supra-nuclear swallowing center. The reflex tensor or soft palate spasm may also take place on an hysterical basis, in the sense that from a psychogenic source with general heightened reflex excitability, a state of tension arises which is favorable for the production of the reflex twitching. The occurrence of continuous rhythmic cramps affecting the entire swallowing musculature on an hysterical basis has never yet been described. The few cases of spasms of this sort in organic disease which are to be found in the literature were only inadequately observed. The author describes 3 cases from his own experience in which the continuous rhythmic spasms of the swallowing apparatus were the permanent symptoms left from apoplectic seizures. In all 3 cases there were found, at autopsy, apoplectic cysts situated in nearly the same places in the cerebellum, namely in the region of the nucleus dentatus. In 2 cases, the cysts were on the homolateral side with the spasms, and in 1 case of bilateral spasms, the cysts were on both sides. In all 3 cases, there were also synchronous twitchings in other muscle regions; in the first case, there were twitchings of the levator palpebræ; in the second case, in the intercostal muscles; and in the third, in the orbicularis oculi. It may, therefore, be assumed that continuous rhythmic spasms are produced in very different muscle regions in diseases of the cerebellum, and that, therefore, there are in this organ distinct localizations.

S. E. JELLIFFE.

NONNE, M.: Multiple Sclerosis and Facial Paralysis. *Zeitschrift für Nervenheilkunde*, 1918, lx, 201.

The writer offers further clinical proofs of Oppenheim's view that in multiple sclerosis a facial paralysis may precede the development of other typical phenomena. It has fleeting, but also occasionally recurrent characteristics. Anatomically there is probably a pon-

tine, localized lesion. A little more light is thus cast upon the hitherto obscure etiology of recurrent facial paralysis. Hence in a case of unknown cause, especially if it is recurrent, preliminary symptoms of multiple sclerosis should be watched for.

S. E. JELLIFFE.

REICHARDT, M.: Theory Concerning the Soul. *Journal für Psychologie und Neurologie*, 1918, xxiv, p. 168.

Although the brain is the seat of many vital processes, only a part of these enter into subjective consciousness and an unbridged chasm exists between certain of the life processes in the brain and those conscious phenomena which constitute immediate inner experience. The real motive force of life, the author holds, is not a quality inherent in the psychic factor, but one dependent on a sub-psychic central station of the highest order. Consciousness to a certain extent is an instrument of the central station, thus serving the organism in its relations to the environment and in the performance of purposeful activities, but also for the entire physical organism inclusive of the vitally important vegetative nervous system, controlling the spontaneity and purposeful self-direction of all the phenomena of life. From it proceed the impulses of the psychic sphere and of the emotional life. Attention and appetite, too, are properties of the subpsychic processes. What is called soul, therefore, in the original sense of the word, is an ultimate property of the subpsychic vital phenomena whose unity is the result of the entire centralized vital forces. Referring to the anatomical side of the problem, the author gives a schematic representation of this central process in relation to the other mental processes, stating that the psychic phenomena proper, the psychosensory, mnemonic and associative processes are localized in the brain cortex, but that this higher central station has its localization in the brain-stem, as has also the vitally essential central vegetative apparatus. The central gray matter seems to be an especially important region for the psychic central function as well as for the vegetative element, that is to say, the inner lining membrane of the brain-stem toward the third and fourth ventricles. In psychology it is customary to make a distinction between intelligence and character, between mind and soul. The au-



thor assents to this distinction, but goes a step further and assumes a separate spacial localization for these quantities and brings the soul into relation with a definite portion of the brain, i. e., the brain-stem. In proof of this view he emphasizes the astonishing unity and harmony of normal mental life and adduces the fact that mental diseases such as *dementia precox*, manic depressive insanity, paranoia, etc., are not in the strict sense due to loss of intelligence, but are disturbances of the vital central function.

S. E. JELLIFFE.

v. MONAKOW, C.: Concerning the Development and Pathological Anatomy of the Rhomboidal Plexus (Rautenplexus). *Schweizer Archives für Neurologie und Psychiatrie*, 1919, v, No. 2, p. 378.

There have been many lively discussions recently concerning the nature of instinct and feeling and the rôle of the inner secretions in relation to the emotions and appetites, giving impulse to the study of the finer morphology and the evolution of the secretory organs. There is a constantly growing belief in the theory that the neuroses and psychoses are caused by disturbances in the sphere of instinct and its substratum and not by affections of orientation. For this reason the author undertook the study of the choroid plexus, which may be regarded as a physiological membrane designed for the biological protection of the brain. He feels quite positive that the plexus choroidei of the hemispheres shows structural abnormalities in certain mental diseases (especially in schizophrenia), and now turns attention more especially to the rhomboidal plexus (plexus choroidei laterales and mediales of the rhomboidal fossa). From study of embryonal formations he was able to establish that the two ventricular chambers contained in the rhomboidal plexus constitute an entirely isolated space, at no place in connection with the arachnoid space of the oblongata, and he found neither the foramen Magendie nor the so-called foramen Luschka, (the communication outward assumed for the lateral recess of the ventricle). Of great importance from a clinical or psychologico-pathological point of view is the relation of the lateral recess to the tuberuculum acusticum, the ganglion ventrale acusticum and the lateral walls of the flocculus. The lateral caudal

part of the tuberculum acusticum with the ganglion ventrale form the lateral wall of the recess and both are also without any hiatus covered ependyma cells, so that they are in many places in direct contact with the vascular tufts, and are washed by the liquor ventriculi, while the median wall and the anterior part of the ganglion ventrale and the basal part of the tuberculum acusticus lie outside of the recess, are free from ependyma, and are directly covered by the pia (which is very rich in vessels), or by the arachnoidea. Thus the lateral parts of the acusticus region depend chiefly for nutrition upon the liquor ventriculi (supply of materials or ferment substances for the function). The medial and anterior parts, on the contrary, receive nutrition from the arterial blood (supply of oxygen, salts, etc.). The supply of ventricular fluid to the regio acustica, then, and perhaps to a small part of the vestibularis, comes from the lateral recess of the fourth ventricle and it may be assumed with probability that from this point there is also communication with the labyrinth. From a pathological-anatomical point of view the author was principally interested in the disease forms where, beside general degeneration in the hemisphere plexus, there were also similar changes in the rhomboid region. He considers it possible that an accumulation of injurious substances in this region would cause a series of toxic effects which would find expression in troublesome sensations, especially where there were concurrent disturbances in the cortex. These eccentric sensations, being under the influence of electricity, etc., would be attributed by the patient to peripheral disturbances, and where there was agglutinated or fragmentary causality, as in schizopherenia, would lead to somatic hallucinations, hearing of voices, insane ideas, etc. All arising (intermittently it might be) from pathological changes in the chemical composition of the ventricular fluid, especially secreted in the rhomboid region.

S. E. JELLIFFE.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION,  
ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,  
of  
INTERNATIONAL MEDICAL DIGEST

Published Monthly at Hagerstown, Md., for October 1, 1920

State of Maryland }  
County of Washington } ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Geo. A. Wilson, who, having been duly sworn according to law, deposes and says that he is the Managing Editor of the International Medical Digest, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 344, Postal Laws and Regulations, printed on the reverse of this form, to wit:

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GEO. A. WILSON, Managing Editor.

Sworn to and subscribed before me this 30th day of September, 1920.

(SEAL.)

JOHN C. BOLINGER

(My commission expires May, 1922.)





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# INTERNATIONAL MEDICAL DIGEST

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## SECTION ON GENERAL MEDICINE

TSANG, G. N.: The Effect of Tobacco on the Vascular Wall. *The Journal of Laboratory and Clinical Medicine*, May, 1920, v, No. 8, p. 534.

The inhalation of tobacco causes a contraction of the artery. The rise of blood-pressure after smoking may sometimes be due to a change in heart-rate; it is sometimes due independently to the vasoconstriction. The injection of nicotin causes a vasoconstriction. Such vasoconstriction is due either to the augmented adrenal secretion caused by nicotin, or to a direct, local action of nicotin on the vascular wall, or to its action on the vasomotor center. Tobacco affects not only the artery but also the vein. The effect of tobacco on the vascular wall may be shaded somewhat by its action on hemoglobin and consequently a vasodilation may come to neutralize its results to some extent.

C. M. ANDERSON.

KOBRAK, F.: Vascular Disturbances of the Labyrinth and its Relation to Ménière's Disease (Die Gefässerkrankungen des Ohrlabyrinths und ihre Beziehungen zur Ménière'schen Krankheit). *Berliner klinische Wochenschrift*, Feb. 23, 1920, No. 8, p. 185.

Ménière's disease may run under the picture of a mild vertigo or tinnitus. Vascular disturbances of the labyrinth, anemia, hypere-

mia, hemorrhage, infectious metastatic processes, increased permeability of the vessel wall, nasoconstriction, emboli, endarteritis, leukemia, may produce these symptoms. The author thinks that Ménière's syndrome may be due to angiospastic labyrinthine crises.

He classifies labyrinthine angiopathies as follows:

(1) Angiopathica labyrinthina vasomotorica: (a) hypotonica; (b) hypertonica.

(2) Angiopathica labyrinthina neurotica: (a) constringens with anemia; (b) dilatans with hyperemia. 1 and 2 may be combined.

(3) Angiopathica labyrinthina stenosans (arteriosclerotica, syphilitica, etc.).

(4) Angiopathica labyrinthina obliterans: (a) thrombotica; (b) embolica. 3 and 4 may be combined.

(5) Angiopathica labyrinthina hemorrhagica—"Ménière".

*Symptoms.*—Type I.—Tinnitus and vertigo.

Type II.—Migrainous and epileptiform attacks (epileptic equivalent), and labyrinthine deafness.

In other types tinnitus and vertigo are constant and more intense and are characterized by exacerbations. In the severest type unconsciousness may exist. Hearing is usually diminished for high tones.

Kobrak reports a case of hypertension with Ménière symptoms in which the attack was immediately curtailed by inhalations of amyl nitrite. Small doses of quinin dilate labyrinthine vessels.

H. JOACHIM.

CORBIER, V.: Some Phases of Generalized and Localized Arterial Hypertension and their Prognostic Value. *Archives des maladies du coeur*, 1920, xiii, No. 6, p. 241.

Cordier followed up his cases of what he calls "acrocyanosis" in soldiers. These cases show periods of arterial hypertension with cyanosis and localized edema. Their evolution lends proof that these cases become hypertensive states of cardiac or renal origin. Their tension and peripheral vasomotor symptoms are the first signs of their final cardiorenal disease.



The cyanosis of the hands may extend to the middle of the forearm or it may even be limited to several fingers. The nails are always cyanotic and the circulation in the fingers is slow. There is also mottling of the feet. The cyanosis does not go on to livid hue nor are there any trophic changes.

After a compression of the arm, such as might be produced by the sphygmomanometer cuff, edema of the hands is transient. The hands are cold in about one-third of the cases and commonly also moist with perspiration. The nails may show slight trophic changes, such as longitudinal grooving or white spots in the nail-bed. When the condition has lasted some months, there may be hyperkeratosis of the back of the hands. Tingling sensations, even painful and sometimes muscular cramps may be present in the hands. The central nervous system is always normal.

Four cases of acrocyanosis were observed in pretubercular states; 7 showed nephritic hypertension with enlarged heart; 4 were cardiacs, 2 of which were mitral cases; and 5 were gastroentopathic individuals.

Seventy per cent of the cases showed a daily varying high blood-pressure, both general and localized; this was shown by a number of patients who had only unilateral acrocyanosis. In these there was a difference of systolic pressure of from 15 to 30 mm. Hg between the two arms.

Two cases showed a slight hyperthyroidism and two a hyperadrenalism. In the regions affected, there was a hyperglobulia and a slightly increased fragility of the red cells. Otherwise the blood was normal. The cerebrospinal fluid was normal in 9 cases examined.

The syndrome occurs after thirty-five years of age. Alcohol as well as alimentary intoxications and fatigue of war (trench-life, anxiety, etc.) were important predisposing causes. The cases begin as acrocyanosis and promptly develop renal disease with hypertension; or they show mitral stenosis or aortic dilatation soon after the onset; or they remain pure hypertensive functional states.

The pathogenesis permits four hypotheses:

(1) Spasm of the peripheral vessels, or frost-bite. This would show more frequent tropic disturbances such as are found in Raymond's disease.

(2) Neurovascular lesions situated higher up, as in the arterial tree and in the periarterial sympathetic plexuses.

(3) The acrocyanosis is a symptom of a general vasomotor disorder under the influence of a cardiorenal lesion or of the vasomotor center.

(4) Acrocyanosis may be considered as early non-progressing stage of Raymond's disease.

M. H. KAHN.

BENON, R.: Clinical and Critical Study of Angina Pectoris. *La Presse médicale*, Jan. 21, 1920, xxviii, No. 6, pp. 56-57.

(1) The onset of an attack of angina pectoris is characterized by a severe cardiac pain associated with a state of anxiety and epigastric distress. These give rise to a profound asthenia of short duration.

(2) The pain of angina has certain definite characteristics, and is the essential symptom of the disease. With it the attack begins, but it is not always the symptom of greatest importance.

(3) The fear of impending death is a secondary phenomenon. It is caused by the physical distress.

(4) The asthenia which follows the pain and emotional state should be considered as a normal sequel.

S. KAHN.

ETIENNE, G., AND RICHARD, G.: Paralysis of Muscles of Small Arteries in Serum Sickness. *Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, Feb. 20, 1920, xxxvi, Nos. 5, 6, 7, pp. 257-260.

During the course of treatment of typhoid fever by serotherapy, the authors' patient suddenly developed evidence of serum sickness—itching and erythema.

On examining the patient at this time, the radial pulse was imperceptible, both digitally and instrumentally. The brachial pulse could be felt. Five minims (0.30 c.c.) of amyl nitrite were given to remove any existing localized arterial spasm, but after this medi-

cation, neither the radical nor the dorsalis pedis could be felt. Vasoconstrictors were then tried. One mg. (.0154 gram) of adrenalin was given, but there was no change in the pulse.

Two c.c. (32.4 minims) of pituitrin were then given, and after 40 minutes, the pulse became perceptible, but several hours later it again could not be felt.

The following day the symptoms of the serum sickness began to disappear, and simultaneously the pulse appeared in the radial and dorsalis pedis arteries.

This absence of pulsation in the smaller arteries is due to a paralysis of the vasoconstrictors supplying those vessels similar to the paralytic vasodilation of the small arteries of the intestines, which results in the fall in blood-pressure.

The hypotension and asphygmia are nervous in origin and not cardiac, because in experimental anaphylactized animals, atropin is ineffective.

S. KAHN.

KLEWITZ, F.: On the Use of Chinoidin in Auricular Fibrillation. *Deutsche medizinische Wochenschrift*, Jan. 1, 1920, xlv, No. 1, p. 8.

The author recalls that recently there have been in the literature several favorable reports from the use of chinoidin in auricular fibrillation. W. Frey (*Berl. Klin. Wochenschrift*, 1918, Nos. 18 and 36) experimented extensively with this drug and obtained in a large series of cases good but only temporary results. V. Bergmann's (*Münch. mediz. Wochenschrift*, 1919, No. 26) reports are also favorable. The latter was able in 6 out of 9 cases to relieve the fibrillation and to bring about the disappearance of the dangerous symptoms of congestion without the simultaneous administration of digitalis.

Klewitz's observations deal with 15 cases. Thirteen of these were treated with chinoidin and 2 with chinin. Eight of the 15 were decompensated; in the remaining 7 there were no evidences of passive congestion; most of these came to the clinic for other ailments and the fibrillation was accidentally discovered during the routine examination of the patients. In 8 cases the chief difficulty was an

old mitral lesion; in the remaining 7 there were various complaints, the most prominent of which was myocardial weakness.

The method of administration follows: Most of the patients received daily from 0.8 to 1 gram (from 12.346 to 15.43 grains) of chinoidin divided into four or five single doses of 0.2 gram (3.086 grains) each. Later he gave daily 1.2 grams (18.516 grains) divided into three single doses of 0.4 grams (6.172 grains). In some individual instances he administered in this measure: 8 grams (123.46 grains) of the drug during a period of six or seven days, but in most of the cases, when no results were evident after three or four days, the drug was discontinued. The progress in all cases was checked up by electrocardiographic examinations.

Of the 15 cases treated with chinoidin and chinin, the author saw in 1 case only a lasting improvement. This was in the case of a young girl with acute endocarditis. She had slight fever, but no signs of passive congestion. After three days' treatment with chinoidin in doses of 0.2 gram (3.086 grains) four times daily, the fibrillation disappeared. The patient was cured and a normal cardiac rhythm was apparently reestablished permanently. No results were obtained in a single case of the remaining 14 patients. In four instances the beneficial effects of chinoidin were manifested by the fact that the pulse became slower and more regular; several patients also stated that "they felt their hearts to be more quiet." In 1 of these patients while under treatment with chinoidin, an auricular flutter became converted into an auricular fibrillation. The drug did not have the slightest effect upon the passive congestion; as a matter of fact, the author was compelled, in the badly decompensated cases, to administer digitalis at the same time that he gave chinoidin.

In the majority of cases chinoidin was well borne; this was so, even in a patient in whom chinin gave rise to noises in the ears and cardiac distress. In 2 cases the drug had a markedly deleterious effect upon the circulation; this was manifested by an increasing cardiac weakness and by an aggravation of the symptoms of decompensation; after the withdrawal of the drug the heart's action became considerably improved. In a third case no relationship could be established between the administration of chinoidin and the circulatory weakness. There is no doubt that chinoidin can not be considered an indifferent remedy. Klewitz agrees with von Bergmann when the latter recommends that in all cases the treatment with chi-



noidin is to be preceded with a preliminary trial administration of small doses of the drug.

In some cases in which chinoidin medication had no effect, the combined administration of digitalis and chinoidin was followed by gratifying results. After prolonged administration of this combined form of therapy, the results were much better than one sees when digitalis alone is administered, although in no case could the fibrillation be said to have been removed.

It is of great importance to be able to determine in which cases of auricular fibrillation chinoidin may be expected to yield good results; possibly the duration of the disturbance of the rhythm may be a significant factor. The author hopes that future experience may teach the precise indications for chinoidin therapy; at the present time, its action seems to be rather uncertain.

M. KESCHNER.

HOOVER, C. F.: Obstruction of the Hepatic Veins. *The Journal of the American Medical Association*, June 26, 1920, lxxiv, No. 26, p. 1753.

Hoover reports 2 cases in which *intra vitam* diagnosis has been made at Lakeside Hospital, though heretofore the condition described in the article has been recognized only at autopsy. He has collected reports of 30 cases from the literature. The essential clinical signs of obstructed hepatic veins are:

- (1) Acute enlargement of the liver.
- (2) Increased convexity of the upper surface with corresponding difficulty in palpating the free border, which is rounded.
- (3) Increased resistance.
- (4) Pain on pressure.
- (5) An ascitic exudate which is opalescent, does not clot readily, contains many red, but few white blood-cells and averages in specific gravity between 1.004 and 1.014.

Important negative findings are absence of choluria and cholemia and no increase of urobilin. No icterus was present in either of the author's cases and others emphasize this point.

Cardiac conditions must be carefully excluded. One patient

presented severe pain extending mesially from the episternal notch to the epigastrium, with cough, choking sensation and air hunger on exertion. Thirteen weeks later violent liver pain with rapid enlargement and ascites developed.

He was tapped twenty-seven times in one year. In the other patient the pain was lacking, but he had air hunger and projective vomiting was induced by vigorous exertion and by coughing or laughing heartily. He later showed the obstruction signs. Both had moderate febrile periods.

The author's analysis deserves to be read *in extenso*.

H. G. WEBSTER.

ESMEIN, C., AND HEITZ, J.: Nitrogen Retention in the Blood in Patients with *Pulsus Alternans*. *Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, Feb. 6, 1920, xxxvi, Nos. 5, 6, 7, pp. 173-179.

The authors studied 25 patients, who were suffering with nitrogen retention in the blood and who had a *pulsus alternans*, in the hope of finding a relationship between the two. Two possible explanations are offered:

(1) That the condition promoting the nitrogen retention also causes the alteration of the pulse.

(2) That the alternation is due to the nitrogen retention.

Experimentally, alternation can be produced by chloral and glyoxylic acid. The latter is a product of disintegration of uric acid in the presence of muscle or tissue extracts, and could, like uric acid, be retained in the blood of patients suffering with nitrogen retention. On a low nitrogen diet—with no other treatment—the alternation disappears in a few days in these cases.

The authors are therefore of the opinion that the nitrogen bodies in the blood play an important rôle in producing alternation.

Alternation is due to two factors: (1) Ventricular weakness due to hypertension; (2) nitrogen retention. The importance of each of these differs in individual cases.

Therapeutically, a low nitrogen diet is indicated in cases with alternation, in addition to cardiotonic and diuretic remedies now used.

S. KAHN.

PARKINSON, J., GOSSE, A., AND GUNSON, E. B.: The Heart and its Rhythm in Acute Rheumatism. *Quarterly Journal of Medicine*, July, 1920, xiii, No. 52, p. 363.

Rheumatic myocarditis is the foundation of much myocardial disease, and often originates while the patient is actually under medical supervision, yet the diagnosis of acute myocarditis during an attack of rheumatic fever is usually only a presumption. This study consists of observations upon 50 consecutive patients with definite rheumatic fever, in which daily changes in rhythm were noted. The conclusions reached are based upon over a thousand polygrams and electrocardiograms.

The pulse-rate usually fell with the temperature and in many cases reached a low figure, 40-50 being not uncommon during the first week of freedom from pyrexia. Sinus arrhythmia was present at some time in all except 3 of the cases; it occurred in conjunction with or following heart-block in each of the 15 cases which showed block. Auricular premature contractions were recorded in 7 cases. They lasted two or three weeks and usually were absent when the patients were discharged. Their close association with block and auricular flutter in some cases, suggests that they indicate myocardial invasion. Ventricular premature beats occurred in a few cases but were of short duration. Some degree of auriculoventricular heart-block developed in 15 of the 50 cases. No case of complete heart-block was observed. The occurrence of block had no relation to the pulse-rate. No patient was taking digitalis at the time of the onset of block; hence the drug factor can be safely eliminated. Acute block during rheumatic fever is almost always transient, disappearing during convalescence even in the rare cases of complete block. It is believed that acute heart-block indicates acute myocarditis and that recovery in some degree occurs, but that it may also leave the possibility of more serious myocardial disease later.

Auricular fibrillation was not seen in any of the 50 patients. This arrhythmia is a frequent sequel to acute rheumatic fever, but it rarely, if ever, develops during an attack. It is most often seen in rheumatic hearts which are also the seat of chronic valvular disease.

Auricular flutter was noted in 1 case in which a paroxysm lasting for fourteen seconds was recorded. It was preceded by frequent

auricular premature contractions and the only subjective symptoms were a feeling of discomfort in the chest and a desire to swallow. No example of paroxysmal tachycardia was observed except as noted under auricular flutter.

The authors reached the following conclusions:

(1) The size of the heart varied little during the attack. The large heart discovered in acute rheumatism depends upon a complication or proves to be the sequel of a previous attack. The presence of enlargement during an attack has been much exaggerated.

(2) Sinus arrhythmia was present after the attack in 47 cases. It was present in 2 cases with a pericardial rub, 1 with a pericardial effusion, 1 after auricular flutter, and in each of the cases which had developed heart-block. The presence of sinus arrhythmia does not indicate that the heart has escaped infection.

(3) The frequency of auricular premature contractions in this infection, and their association with flutter and heart-block, suggests that they indicate acute myocarditis.

(4) Acute heart-block developed in 15 cases. It often appeared quietly in the absence of other signs, such as pyrexia and tachycardia, and it invariably disappeared during convalescence. We conclude that acute heart-block of some grade is common in acute rheumatic fever; that it indicates acute myocarditis; and that it may therefore be premonitory of chronic myocarditis and eventual heart failure.

(5) An irregularity observed from time to time in 3 patients is interpreted as ventricular automatism rather than nodal rhythm. It is the author's belief that nodal rhythm does not occur in acute rheumatic fever, in spite of several reported cases.

C. F. NICHOLS.

CONN, I. M.: Primary Cancer of the Liver. *The Journal of Laboratory and Clinical Medicine*, May, 1920, v, No. 5, p. 528.

The occurrence of primary malignancy of the liver is very rare. The etiology of this disease is unknown, but it is thought by some investigators to be due to (1) irritation of liver cells, (2) congenital origin, and (3) compensatory hyperplasia. There are three types



of carcinoma of the liver, massive, diffuse and nodular. The massive type occurs most frequently, the diffuse type is very rare, and the nodular, or multiple primary carcinoma, is more common. Primary carcinoma in a cirrhotic liver is a fourth type, while primary melanotic carcinoma is a fifth type. Primary sarcomas are divided into five classes similar to carcinoma. The tumor is made up of small round cells, spindle cells and other types.

The symptoms are: cachexia; anemia; digestive disturbances; right hypochondriac pain; tumor in the abdomen; icterus when the bile-ducts are occluded (63 per cent); ascites when lymphatic obstruction occurs (58 per cent); edema (41 per cent); splenic tumor (32 per cent); and fever (14 per cent). The duration is from fourteen days to a year, the average being six months. It occurs at any age. It is more common in men. The macroscopical classifications are: (1) Nodular—more common; (2) massive; and (3) diffuse—rare. The microscopical classifications are: (1) Simplex; and (2) adenomata. Metastasis comes at a later period than with malignant diseases elsewhere in the body, and the metastases are not so wide-spread. The retroperitoneal glands and omentum are frequently involved, but the supraclavicular glands are seldomly involved. The lungs are very rarely involved and very rarely the heart. The tumor may weigh as much as 267 ounces.

C. M. ANDERSON.

BRIGHAM, F. G.: Observations upon Various Types of Diabetes under the Present Method of Treatment. *Boston Medical and Surgical Journal*, Aug. 5, 1920, clxxxiii, No. 6, p. 165.

Although it is only six years since Dr. Allen read his paper which revolutionized the treatment of diabetes mellitus, and although this brief time is in no way sufficient in which to draw final conclusions, yet from the results obtained there has accumulated a large amount of interesting data which has been carefully reviewed and which is well-worth recording. From a study of ten years the following conclusions are drawn:

(1) By all the modern methods of low calory diet the diabetic patients show more improvement than by former methods.

(2) Without careful blood estimations, diabetics cannot be satisfactorily treated and good results cannot be obtained.

(3) The complications of diabetes will develop even though the urine contains no sugar, if the blood figures remain high.

(4) The prevention of obesity will reduce the number of diabetics tremendously.

(5) The study of other functions such as kidney function, and the removal of all possible foci of infection, are essential to having the diabetic patient improve.

(6) Routine twenty-four-hour urines must be done more frequently, or more routinely, in order that diabetes as well as other kidney conditions may be recognized and treated earlier.

The disease illustrates the importance of laboratories in which simple routine analyses can be made at a reasonable figure.

M. M. BANOWITCH.

LOEPER, M.: Chronic Dyspepsia in the Gassed (*Les Dyspepsies chroniques des Gazés*). *Bulletin de l'Académie de médecine*, Paris, Feb. 24, and March 2 and 9, 1920, Nos. 8, 9, and 10, p. 217.

The intoxications by mustard gas received during the late war have very often produced gastric troubles which occur in two different types, the flatulent type which is similar to nervous dyspepsia, and the painful type, whose appearance is generally late. Between these two types there are, however, some intermediate types less clearly differentiated.

The clinical picture of this kind of toxic dyspepsias is generally as follows:

The late reactions are, in the opinion of the author, due to the presence of pyloritis accompanied by salivation, nausea, and even vomiting. There may be hypo- or hyperchlorhydria, according to the depth of the lesions. The *x*-rays disclose only scarry deformations. The gastric manifestations are true attacks of gastritis; these can be established by the cytologic analysis of the gastric contents. The characteristic findings of these analyses are: a great number of epithelial cells due to desquamation, and great numbers of leukocytes.

The first condition corresponds to the hyperacidity, and the latter indicates an infection of the mucosa. These lesions bear upon the general condition, and upon the circulatory and nervous systems, and produce pain in different parts of the abdomen. This pain is due to the hyperesthesia of the abdominal plexa, however, in some cases it seems to be due to the propagation of the gastric inflammation to the abdominal nerves, and, in other cases, to the impregnation of those nerves with the toxic gas.

The vascular systems are arterial hypotension, arrhythmia, bradycardia, and exaggeration of the oculocardiac reflex. These symptoms are more frequently found in the gastric troubles which follow intoxications through pallite and bromaceton, and they are less frequently found when the intoxication is due to chlorin or hyperitus.

The gastric hemorrhages observed at the beginning of the intoxication, can also be seen as a sequel. A real ulcer of the stomach is very seldomly found. The gastric accidents are accompanied, during a long period, by loss of mineral matter, especially phosphates. In 14 cases examined by the author, the figures of the blood's mineral and phosphoric matters were one-fifth below normal.

C. F. ARROYO.

MELCHOIR, E.: Epigastric Hernia and its Clinical Significance (Die Hernia epigastrica und ihre klinische Bedeutung). *Berliner klinische Wochenschrift*, March 15, 1920, No. 11, p. 248.

The author thinks that too much attention has been given to epigastric hernia from the view-point of symptomatology. He draws an analogy between this and chronic appendicitis.

Various explanations have been given for the causation of the kaleidoscopic symptoms attributed to epigastric hernia. It has been suggested that the cause is a fixed omentum dragging on stomach and liver. In a large experience the author has seldom found omentum in the hernial sac. He thinks that an encapsulated preperitoneal lipoma may be mistaken for the omentum. On the contrary, he often finds omentum in umbilical and inguinal hernias without the bizarre symptomatology accredited to it in epigastric hernia. He dismisses the omental theory as improbable.

Stretching of the parietal peritoneum is another theory advanced. Reflex causation by pressure of the mass upon sensitive nerve-tissue and referred to various viscera, i. e., a reversal of the head zone phenomenon, is also another theory. This theory is dismissed because there is usually no local tenderness. The tissues are also so soft that the author thinks that the element of pressure on nerve-endings could not enter as a factor.

He doubts the glowing reports of cure of symptoms after operation. His own experiences seem to be unfavorable. Adhesions may be a factor in the recurrence of symptoms. He thinks that ordinarily the finding of an epigastric hernia is of no significance and that it is only an accidental finding associated with some other visceral lesion. As a rule these hernias are symptomless and are accidentally discovered in routine abdominal examinations.

H. JOACHIM.

NILES, G. M.: Alleviation of Distressing Digestive Symptoms in Cardiorenal Disease. *The Journal of the American Medical Association*, Dec. 27, 1919, lxxiii, No. 26, p. 1932.

The distressing gastro-intestinal symptoms in cases of combined heart and kidney disease, including flatulence, are best removed according to Niles by the freshly prepared infusion of digitalis leaves. His short article contains three formulae, and a suggestive diet list.

H. G. WEBSTER.

McCLURE, C. W., AND REYNOLDS, L.: Gastric and Duodenal Ulcers: Typical and Atypical Forms; the Relative Values of Diagnostic Procedures. *The Boston Medical and Surgical Journal*, Sept. 9, 1920, clxxxiii, No. 11, p. 321.

Eighty cases of gastric and duodenal ulcer were studied. Fifty-five diagnoses were confirmed by operation, and 25 by x-ray findings and hematemesis. Forty-six were males, 34 females. Neither occupation nor habit seemed to play a rôle in etiology. The duration of symptoms determined in 69 cases varied from ten days to forty years.



In 42 cases it varied from one to twelve years, and in 19 cases from fifteen to forty years.

Cases are divided into typical and atypical groups. Fifty-four cases of the typical form and 26 of the atypical form were studied. Of the typical cases 28 had the ulcer in the first portion of the duodenum, and 20 in the stomach, of which, in 5, the ulcer was on the lesser curvature some distance above the pylorus.

The atypical group was further subdivided into types:

(1) The gall-bladder type, characterized by pain, resembling in all respects that occurring in cholelithiasis. The pain is either in periods of exacerbation or at irregular intervals.

(2) Type resembling malignancy.

(3) Type with constant epigastric pain.

(4) Type with marked vomiting.

The conclusions are: The typical form, with the aid of radiographic findings, may be readily diagnosed with a high degree of accuracy. In the atypical class in many cases the diagnosis cannot be determined without the aid of radiographic findings.

X-ray studies should form a part of the physical examination of every gastro-intestinal case. Their importance in diagnosis is second only to that of the history. They are the most efficient and accurate aid in the differentiation of functional and organic pyloric obstruction, and of ulcer and cancer. In the majority of cases laboratory findings are of less value in diagnosis than x-ray studies.

The laboratory findings which are valuable in diagnosis are gross amount of blood in vomitus or gastric contents, the frequent vomiting of old food residues, and tarry stools. Findings of less value are the persistent presence of occult blood in the stools, the presence of food residue in the gastric contents, and the presence of free HCl in the gastric contents.

M. M. BANOWITCH.

LARRABEE, R. C.: The Diagnosis and Treatment of the Hemorrhagic Diseases. *The Boston Medical and Surgical Journal*, August 5, 1920, clxxxiii, No. 6, p. 151.

The object of the paper is to state the clinical facts concerning the principal diseases characterized by tendency to bleed. Two simple

bedside tests that can be performed are the estimation of bleeding time and of coagulation time. Normal bleeding time is from one to three minutes; anytime over eight minutes is distinctly abnormal. Prolongation of bleeding time means usually a deficiency in blood platelets. It also occurs in cirrhosis and in other liver diseases where fibrinogen is deficient. The usual coagulation time is from four to eight minutes. When it is over twelve minutes, it is distinctly pathological. Prolonged coagulation time signifies deficiency of one or more of the several chemical substances concerned in the complicated process of fibrin or clot formation. Normally, after a few hours the clot retracts. Failure to do so is evidence of decrease in platelets. In the aplastic group of cases the chief, and in some the only, factor involved is the platelets. When they are decreased to a fifth or less of the normal (300,000), the tendency to bleed is manifest. In purpura hemorrhagica the only lesion is decrease of platelets. Bleeding time is prolonged but coagulation time is normal. In aplastic anemia the functional deficiency of the marrow involves its platelet function, its property of producing certain leukocytes, notably neutrophils, and the red corpuscles as well. There is a prolonged bleeding time and a prolonged coagulation time. Leukemia shows a decrease of platelets with resulting increased bleeding time.

In hemophilia the disease is due to a deficiency of prothrombin. Bleeding time is normal, platelets are normal in number though not in quality, but coagulation time is prolonged, sometimes over an hour.

Hemorrhagic disease of the new-born is similar to hemophilia, that is, the deficiency is due to prothrombin. Bleeding time is normal, and coagulation time is prolonged.

Several conditions of the liver and bile passages exist in which hemorrhage is particularly prone to occur. The most significant from its frequency and surgical importance is chronic obstructive jaundice. It is due to deficiency of available calcium in the blood. Here the coagulation time test is a help. If normal, the operation is safe; if prolonged, operation is unsafe and should be postponed.

Cirrhosis of the liver often shows a tendency to bleed. Platelets are normal, but bleeding time is prolonged. Coagulation time is normal, but the clot is flabby and of poor quality. These conditions are due to a deficiency of fibrinogen. In their treatment local applications, on the whole, are not very satisfactory. Cephalin and tis-

sue extracts, while of value when applied locally, do not have so much value when administered intramuscularly. Calcium salts, are of value if bleeding is due to a deficiency of these salts, as in chronic obstructive jaundice. Animal serums when fresh contain prothrombin and are of value in hemophilia and hemorrhagic diseases of the new-born, but they are of no value in bleeding due to lack of platelets. The intravenous administration of whole blood is best because it supplies not only all elements of coagulation but also red corpuscles to combat the anemia. If intravenous transfusion cannot be done, whole blood may be used intramuscularly.

M. M. BANOWITCH.

BAILEY, C. V., AND MACKAY, A.: Toxic Jaundice in Patients under Antisyphilitic Treatment. *Archives of Internal Medicine*, June, 1920, xxv, No. 6, p. 628.

The authors report a detailed chemical study of a number of soldiers at the Sixteenth Canadian General Hospital who developed toxic jaundice after the use of combined arsenobenzol derivatives and mercury. Many of the cases were associated with arsenical skin lesions. There were observed: general malaise and jaundice, enlargement of the liver and frequently enlargement of the spleen, and blood-pressure and pulse usually low. Sometimes symptoms similar to those of acute yellow atrophy supervened with a fatal issue, and sometimes the patients slowly convalesced.

The chemical studies were undertaken with the idea of avoiding such accident. It was found that these patients invariably showed an early and marked increase of the cholesterol of the blood. The detection of such an increase may be of value in detecting the onset of liver injury. The protective action of glycogen in the liver against such poisons as arsenic was considered important and the value of a diet comparatively rich in carbohydrates emphasized. Conversely, nitrogen and fat should be restricted. A definite increase in the products of nitrogen metabolism was found in the blood of patients who were up and about, as compared to those who were confined to bed. The authors emphasize the importance of limiting the amount of exercise in any patient who is taking intensive antisyphilitic treatment and of prescribing a diet rich in carbohydrates and poor in nitrogen and fats.

T. HOWARD.

MILIAN, G.: Jaundice Which Appears Some Time After the Use of Novarsenobenzol (in Syphilis) Is Due to Hepatic Syphilis. *Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, Feb. 20, 1920, xxxvi, Nos. 5, 6, 7, pp. 226-229.

Milian is of the opinion that the icterus, which sometimes appears during the course of treatment of lues with novarsenobenzol, and after the course of treatment has been completed, is due to hepatic syphilis. Other observers believe that the icterus occurring only during the course of treatment is syphilitic in origin. They think that late icterus—after treatment has been finished—is due to a toxemia.

It appears to Milian that jaundice, which first appears from six to eight weeks after the last injection of an arsenical compound, cannot be due to toxins resulting from the destructive action of the arsenic.

The author describes 2 cases of lues, in both of which a late icterus developed. Further treatment with arsenobenzol produced a cure, with the disappearance of the jaundice.

The following reasons are given for the author's opinion that the icterus is due to hepatic syphilis and not to toxins:

(1) Icterus develops three times more frequently after the treatment is completed than during the period of treatment. If the icterus were due to toxins resulting from the action of the arsenic, the jaundice would appear while the patient was under treatment.

(2) The jaundice appears usually from eight to ten weeks after the last dose has been given. This corresponds to the period when nerve symptoms appear after treatment with mercury or arsenic.

(3) The jaundice has been observed when the treatment of the patient has not been thorough enough. When the number of injections has been increased, and the dose at each injection has been enlarged, the icterus disappears.

(4) The cure of the jaundice by ante-syphilitic treatment is definite proof that the condition is due to hepatic syphilis and not to toxins. The cure comes on the second or third day following the first injection. There may be a fleeting recrudescence of the symptoms—Herxheimer's reaction—but this quickly disappears.

S. KAHN.



STOKES, J. H., AND BOEHMER, H. E.: Section on Dermatology and Syphilography, Mayo Clinic: Syphilis in Railroad Employees (A Clinical Study of an Occupational Group). *Journal of Industrial Hygiene*, Jan., 1920, i, No. 9, p. 419.

The writers have been under the impression for some time that syphilis is an exceptionally common disease among railroad employees. Thus it constitutes a grave unrecognized menace to personal welfare, industrial efficiency and to the safety of the travelling public. The following statements are based on a review of 3000 unselected histories in the Mayo Clinic. The review was made in order to compare the incidence of the disease in railroad men with its occurrence in other occupations. In connection with this general study a special study was also made of 50 cases of syphilis among railroad men to determine the types of late complications most prevalent and the methods of examination best suited to detect the disease.

Of the 3000 general histories, 1657 were grouped under fairly representative occupational heads and included men and their wives—1143 of the former and 514 of the latter.

TABLE I

OCCUPATIONAL TYPES	MEN ONLY		HUSBANDS & WIVES	
	Cases	Per cent of Syphilis	Cases	Per cent of Syphilis
Railroad employees	128	11.7	184	10.3
Laborers	243	6.1	297	6.9
Business Men (Tradesmen, Merchants)	236	3.8	311	3.2
Farmers	536	.5	865	1.4
Total	1143		1657	

As may be seen syphilis is approximately eight times as prevalent in railroad employees as it is in farmers, twice as prevalent as it is in common laborers and three times as prevalent as it is in merchants and tradesmen.

Currently accepted estimates based on the clinical judgement of experienced syphilographers place the disease as present in from 10 to 15 per cent of the adult population. The figures of hospitals, based on the Wassermann test place the figure at 19.2 per cent.

The authors' results showed that, when patients were subjected to medical examination alone, syphilis was detected in only 3.1 per cent. Part of the discrepancy is due to the weakness of unaided judgment, but part also is due to the fact that the authors' cases were drawn from a section of the country where the percentage of venereal infection is low. On the other hand, the high figures of the Wassermann surveys include probably an uncertain, though small percentage of false positives; also city hospitals and dispensaries draw from a clientele very different from that of the country.

From time to time attention has been called in the literature to the menace of syphilis of the central nervous system to the safety of the public, particularly when the disease takes the form of paresis and epileptiform seizures in men responsible for the operation of trains.

The 50 railroad employees whose cases were considered in this special survey included locomotive engineers, firemen, trackmen, switchmen, conductors (excluding dining car), section hands, yard foremen, inspectors, telegraph operators, signal maintainers and station agents. For years such men had been ostensibly under medical surveillance. Their health record is indicative, therefore, of the efficiency of the industrial medical practice of the past. There is need, surely, of modern revision of methods and conceptions in medical supervision.

Because of the tendency to masked onsets, the limited value of a history of infection is shown by the fact that 24 per cent of the 50 syphilitics could give no history of infection other than gonorrhea. In 62.5 per cent there were no recognizable secondary manifestations. Therefore, the search for syphilis in a patient and in members of an industrial group should be brought to the patient. To wait for the patient to seek advice directly, exposes him to the risk of late complications and to errors in diagnosis.

*Age Data.*—One-fourth of the patients (26 per cent) were infected between the seventeenth and twentieth years; by the twenty-fifth year nearly 60 per cent were infected and by the thirty-first year 91 per cent were infected. It would seem practical to suggest, therefore, that (since Wassermann test is most reliable in the early stages of infection) the test should be applied to men between the ages of 17 and 25 (in which age limit 60 per cent of the infections occur) on entering railroad service and that the test should

again be applied on the same group at the age of 31 (at which age 91 per cent of cases occur).

The age at which relief is sought for late symptoms would suggest the age group which should be subject, at the present time, to the closest watching. In these 50 cases, over one third of the onsets of late complications were in a five-year period from sixteen to twenty years after infection. Of the remaining part of the 50, a little less than one-half occurred within fifteen years. Nearly 70 per cent of the men in this series appeared for examination before the forty-fifth year, yet two great railroad systems do not begin routine annual examinations until the employee reaches fifty years of age. Six out of eight railroads content themselves with examinations once in three years during the very period when syphilis is most likely.

The danger in diagnosis by general examination only lies in the habit of grasping uncritically and unsuspectingly at the chief complaint of the patient. Nearly half of the above 50 cases were either mis-diagnosed or not diagnosed at all before the patients entered the clinic and all but one were late cases of syphilis. The blood Wassermann test was strongly positive in only 43 per cent of the series; 4 per cent were weakly positive and 53 per cent were completely negative, thus showing unreliability of this reaction in late cases. The test on the spinal fluid proved of more value. While laboratory procedures contribute 58.7 per cent of the diagnoses, the remaining 41.3 per cent were identified by routine methods of physical examination which included recognition of pupillary abnormalities and fundus changes in the eye, signs of cardiovascular involvement (valvular lesions, aortitis, myocardial changes) and neurological changes.

#### TABLE II—EYE FINDINGS

"Lens" reflexes	25 per cent
Argyll Robertson pupils	37 per cent
Unequal pupils	14.5 per cent
Irregular pupils	14.5 per cent
Muscular paralysis	12.5 per cent
Fundus changes	26.5* per cent
(*Based on 34 cases)	

The presence of a high percentage (62.5 per cent) of abnormal eyes in a group of men whose eyes, of all structures in their bodies,

are ostensibly subject to the keenest scrutiny by railroad medical examiners, was a matter for astonishment. Examination should not be limited to vision, color-sense and hearing alone, thus ignoring in its narrowness even the pupil of the eye; nor should it limit its consideration of the body to hernia and the results of injury.

Even an extremely simple neurological examination such as should probably be made a part of any significant medical examination, gave interesting facts. In the cases examined 65.1 per cent showed abnormal reflexes. Among the 50 there were present also mental symptoms (diminished attention, irritability, amnesic attacks), speech defects, ataxia, paresthesia and bladder involvement.

Criticism may be made that 50 cases is too small a number from which to draw deductions. To meet this objection the authors studied an additional set of 50 cases. The analysis of these gave results so similar to the first set that the contention is fully justified—namely that a careful study, with modern methods, of a comparatively small group gives more accurate results than a less detailed examination of a large number of cases.

*Summary.*—The above findings suggest that the routine railroad medical examination is insufficient to protect the public from the dangers of syphilis in men concerned in the operation of trains.

Three suggestions are made:

(1) Routine Wassermann tests should be made on all employees between the ages of 17 and 25 by a competent State Board of Health Laboratory and repeated on all employees reaching 32 years of age.

(2) There should be annual effective examination of all men between the ages of 25 and 40 rather than of men over 50 years. Such examinations should include more attention to pupillary reactions than is given at present and should employ those fundamentals of neurologic examination, such as tests of the deep reflexes, Romberg, etc. These can be readily performed by competent general examiners.

(3) Formal educational propaganda should be undertaken by railroad medical departments for the education of medical examiners and employees alike to the great significance of syphilis in industrial insufficiency and personal ill-health.

B. VON ANTHONY.



HATZIWASSILIU, G. P.: The Relation of the Mortality of Pneumonia to Age Incidence. *Deutsche medizinische Wochenschrift*, Jan. 8, 1920, xlv, No. 2, p. 48.

The author concludes that in pneumonia we have a cause of death which has a selective action, especially on infants and nurslings. It must be assumed that these constitute a most favorable soil for the development of pneumonia, but this is not due to any peculiar biological tendency incident to that age, but to other causes. From the author's statistics it is apparent that amongst these causes the following factors must be taken into consideration.

(1) That the subjects of fatal pneumonia at this age are predisposed to pneumonia by virtue of the fact that at this age diseases which are frequently complicated by pneumonia, such as whooping cough, measles, etc., are so prevalent. (2) That the mortality of pneumonia is so high in children which offer poor resistance to infection on account of bad social conditions, such as poverty, poor environment, poor and insufficient nourishment, over-crowded, living rooms, etc. Whether or not there are some other causes, Hatziwassiliu is not prepared to say.

The fact that the lowering of the pneumonia mortality runs parallel whenever the death rate of the above-mentioned infectious diseases becomes lower, is of great significance to the author.

His study of this question convinces him that the problem of reducing the mortality of pneumonia is one of rational care of children of nursling age.

M. KESCHNER.

BOAS, E. P.: Functional Cardiovascular Disturbances in Tuberculosis. *American Review of Tuberculosis*, August, 1920, iv, No. 6, p. 455.

In this article the author concludes that the functional disturbances of the circulatory, alimentary and nervous systems in the tuberculous are not a specific manifestation of tuberculosis, but are usually conditioned by a constitutional nervous instability of the patient. At times they may appear without such an underlying predisposition, and then may bear some relationship to hyperactivity of the thyroid gland.

The epinephrin test is of no value in the differential diagnosis of doubtful cases of tuberculosis and hyperthyroidism. First, it is not a specific test for the latter condition, but betokens only a heightened sympathetic irritability. It may be positive in frank cases of tuberculosis. Second, symptoms of hyperthyroidism, including goiter and eye signs, occur in a certain number of cases of early tuberculosis and may possibly represent a defense reaction of the organism to the infection.

Patients in whom vasomotor and other functional disturbances are latent and in whom they are activated by the tuberculous infection, belong to the same group as, and are analogous to, those with neurocirculatory asthenia.

C. SCHMID.

PATERSON, R. C.: Intestinal Tuberculosis. *American Review of Tuberculosis*, August, 1920, iv, No. 6, p. 433.

Autopsies show that in 75 per cent of cases of pulmonary tuberculosis which result in death, ulcers of the intestines, of greater or less extent, are found. Even in the advanced stages, granting that these figures be correct, we must assume that a great deal of this intestinal ulceration is latent from a clinical standpoint and produces no recognizable symptoms. This confirms the present findings in the routine x-ray examination of the intestinal tract of persons suffering from pulmonary tuberculosis.

The lesions which are found in intestinal tuberculosis are chiefly ulceration, and a certain amount of fibrosis or inflammatory thickening around the ulcers. The ulcers arise from the breaking down of the lymphoid follicles, and in the small intestine they are apt to be larger in size than in the large intestine in which, especially, in the recent conditions, the ulcers are usually small, about 1 cm. or less in diameter. They are scattered fairly thickly throughout the mucosa. The edges are raised or heaped up, giving the ulcers a crater-like appearance. There is frequently a certain amount of plastic exudate on the peritoneal surfaces overlying the base of the ulcer, and frequently subperitoneal tubercles are seen. The glands in the mesentery are somewhat enlarged. The favorite site of the ulceration is the lower end of the ileum and the cecum. Next in fre-

quency are the flexures of the large intestine, the hepatic, splenic or sigmoid. In many cases the ulcers are widespread, extending from the lower end of the duodenum to the rectum. As to the etiology, the author agrees to a certain extent with the theory that the infection is due to the carrying down of the organism in swallowed sputum, but he also believes that there are phenomena which lead to strong belief in the hematogenous character of the infection and that the latter would explain the widespread ulceration which, on examination, seems to be of the same age. He quotes the general conception of the hematogenous origin of the renal and joint, as well as meningeal, tuberculosis.

In the symptomatology at the onset all general symptoms are increased. Of the purely digestive symptoms anorexia is first. In many cases the eating of food causes pain and such an increased peristalsis that there may be a bowel movement before completion of the meal. Flatulence is common. Pain is present to some degree in most all cases, and is usually localized in the lower part of the abdomen, but it is often referred to the epigastrium. It usually occurs one to three hours after eating, about the time that the food reaches the ileocecal valve. Diarrhea is a frequent symptom, but it is often found only in the advanced stages and obstinate constipation is not infrequently found to be an early troublesome symptom. Diarrhea in these cases is probably due to irritation of the ulcerated areas by the intestinal contents causing increased peristalsis. The constipation, on the other hand, is probably the result of spasm caused by the same irritation, or it may be due to partial obstruction from hypertrophic tissue or adhesions. Examination of the abdomen usually reveals some area of tenderness. The right lower quadrant, corresponding to the most frequent pathological location of the ulcers in the lower ileum and caecum, will usually be found to be the site of tenderness. Often pressure at this point causes referred pain across this level to the opposite side of the abdomen, or to the epigastrium. At times pressure causes a feeling of nausea. In some cases it is possible to palpate a mass in the diseased area; this is due either to the thickening of the bowel or to the massing of the intestines on account of adhesions; these cases are usually of the chronic type. The acute type, in which ulceration is widespread, rarely gives any palpable evidences of thickening. The examination of stools is of little value. Mucus is frequently seen in large masses. In the x-ray ex-

amination the most frequent facts brought out, are the following:

- (1) Hypermotility of the intestines, or increased rapidity of progress of the barium column.
- (2) The arrest of the barium column at the ileocecal valve so that it is behind the normal progress from six to eight hours. This is probably due to spastic closure of the valve, caused by irritation by the mass of the ulcers, or to partial obstruction due to the thickening of the bowel wall, or to adhesions. After relaxation of the spasm, the barium column moves on very hurriedly and in twenty-four hours, we have an empty intestine. This picture is known as "ileal stasis."
- (3) The defective filling of the diseased part. Instead of the evenly filled cecum and colon with sharp clear-cut outline and normal haustral marking, the ulcerated area presents an irregular outline with somewhat fuzzy edges and narrowing of the diameter of the shadows.

The course of the disease is progressive. This makes the prognosis serious.

In treatment the diet is of little value. Theoretically a bland non-irritating diet is recommended, which leaves little residue. Absolute rest, both of the intestines and of the body, is generally a most valuable remedial measure. The question of drugs in the treatment has shown that they are merely palliative. Surgical treatment is considered by the author to be the most valuable measure. Excision of the bowel where it is well localized is the ideal operation. An anastomosis of the various sections of the bowel is perhaps next in value. These procedures offer the greatest hope for the relief of symptoms, or for the arrest and removal of the disease. In the prognostic outlook the condition of the lungs has a very important bearing upon the success of operation, or at least, upon the determination of operation.

C. SCHMID.

CHALIER, J.: Contribution to the Study of Lung Abscess. *Lyon médical*, Mar. 25, 1920, cxxix, No. 6, pp. 249-254.

Usually lung abscess occurs in patients who are suffering from some disease of the respiratory tract—purulent bronchitis, lobar or



bronchopneumonia, pulmonary congestion, and occasionally pulmonary infarction. Because of the persisting fever, with or without remissions, and of original physical signs which are more or less clear, one's attention is centered on the primary disease, and complications are not considered. Thus, lung abscesses are often overlooked at first, and it is only when profuse purulent expectoration occurs, or on the autopsy table, that the diagnosis is made.

Exploratory puncture and x-ray observation are the best means whereby an accurate diagnosis can be established. The author reports a case in which after an attack of grip, the occurrence of lung abscess was strongly suspected because of a persistence of the general poor condition of the patient. Diagnosis was made by exploratory puncture, and not by x-ray.

Chalier emphasizes the importance of thoracentesis, even if the x-ray is negative, when the presence of pulmonary abscess is strongly suspected.

The gradual but progressive emaciation of some patients with very small abscesses, the associated profound asthenia, a real coechetia, are believed to be due to the fact that pulmonary abscess can, in certain cases, give rise to a pseudo-tuberculous coechectic condition.

S. KAHN.

FIELD, C. G.: Chronic Nontuberculous Lung Infection. *The American Journal of the Medical Sciences*, March, 1920, clix, No. 3, p. 442.

A complete analysis of 8 cases is given together with a review of the literature. Many such cases were found following the recent influenza epidemic. Such infections may occur at any age, but they are more frequent before twenty. Females are more prone to the infection. *Bacillus influenzae* is the most frequent predominating organism in the sputum. The symptoms consist of a chronic morning cough with a varying amount of expectoration, usually small, of mucopurulent sputum containing green granular masses. Tubercle bacilli were never found after repeated examinations both with and without antiformin. The general health is relatively little affected. There is anorexia, malaise, and slight loss of weight. Hemoptysis, in fact, any symptoms of tuberculosis may be present, such as moderate fever, night sweats, pain in the chest, etc.

The course is chronic with exacerbations. One case is reported with slight effusion. Ninety per cent of the physical signs are found in the lower lobes. Inspection reveals slight lagging. The percussion note is impaired and typical signs are subcrepitant râles, especially after cough, in one of the lower lobes. Cases with insignificant x-ray findings, purulent sputum persistently negative for acid fast bacilli, râles in the lower half of the chest (in the absence of a heart lesion), a chronic non-paroxysmal cough, and general health slightly impaired are undoubtedly cases of nontuberculous infections, especially when the disease has no tendency to spread to other parts of the lung. Subacute cases of typhoid fever and bronchiectasis must not be confused with this condition.

In treatment drainage is the most essential factor. This can be accomplished by having the patient hang over the end of the bed or kneel on a chair with hands on the floor. Fifteen minutes three or four times a day are necessary at first over long periods, a year or more. Patients soon become accustomed to this and realize the benefit which it gives.

Patients also received inhalations of compound tincture of benzoin following the inversions. Blowing the bottle and other pulmonary gymnastics are sometimes beneficial. As most exacerbations occur in the colder months, it is advisable to recommend a warm climate and out-of-door life, in which exposure to people suffering from colds is avoided. Smoking and dust should also be avoided.

A. T. MAYS.

MACFIE, J. W. S.: Three Cases of Filariasis in which Intravenous Injections of Tartar Emetic Were Given. *The Journal of Tropical Medicine and Hygiene*, 1920, xxiii, 36-38.

The treatments were given as a result of the procedure reported by Roger. Macfie found that tartar emetic in small doses, varying from  $1\frac{1}{4}$  to  $5\frac{1}{2}$  grains (0.0812 to 0.3564 gram), did not appear to have any effect on the number of embryos of *Filaria perstans*, *Filaria bancrofti*, and *Filaria loa* in the blood. The patients were under observation for a period of three or four months after treatment and there was no appreciable effect on the parent worms.

F. HULTON-FRANKEL.

HUME, J. B.: The Enlargement of the Thyroid Gland in Malaria. *British Medical Journal*, Nov. 22, 1919, No. 3073, p. 661.

In 30 cases of malaria in all of which the organism was found in the blood, there was acute enlargement of the thyroid, of one or of both lobes, and this occurred from twelve to thirty hours after the fall of temperature. Associated with this swelling, dysphagia was not uncommon; there were also pain and throbbing in the head, slight tremor, tachycardia of from 100 to 110, and in 2 cases there was exophthalmos. The swelling subsided in large part in ten days, but reappeared with recurring attacks. Disturbances of the adrenal and the testis have also been noted in malaria, and it is concluded that the endocrine disturbances in malaria may be more extensive than our present knowledge shows.

L. C. JOHNSON.

CASTELLANI, A.: Milroy Lecture on the Higher Fungi in Relation to Human Pathology. Lecture III. *Journal of Tropical Medicine and Hygiene*, 1920, xxiii, pp. 133-138.

The older attitude that fungi played no part in skin infections but that they were merely secondary invaders, has been proven absolutely fallacious, and skin affections due to fungi may be divided into the following classes:

- (1) Trichomycoses.
- (2) Dermatomycoses sensu strictu.

Of the first group the following were discussed: (1) *Aspergillomycosis* of the beard; and (2) *trichomycosis axillaris flava, rubra and nigra*.

Of the second group the following were principally discussed: (1) *Tinea flava*; (2) *tinea nigra*; (3) *cryptococcosis epidermica*; (4) *accladiosis*; (5) *blastomycosis*; (6) *dhobie itch (tinea cruris)*; and (7) *tinea imbricata*.

*Aspergillomycosis of the Beard*.—This disease appears as small scales on the hairs of the beard and is due either to *Aspergillus* or *Penicillium*. The treatment is exceedingly simple as the simple expedient of shaving will destroy the fungus, or, in the event that the

native refuses to shave, turpentine is applied. Another hair infection which is quite common in the tropics is Trichomycosis axillaris, which was known under the name of Leptothrix for many years. Until recently the etiology of the disease was supposed by some to be bacterial, the two most common forms to which it was ascribed being a diplococcus or bacilli, one of which was *Bacillus prodigiosus*. The hairs of the axilla are infected (occasionally the pubes also), and show small nodular formations. These nodules may be black, yellow or red and the same person may show one type under one arm and another in the other axilla or both types in the one axillary region, even both types on a single hair. The disease is classified under the three types, Trichomycosis axillaris flava, Trichomycosis axillaris nigra, and Trichomycosis axillaris rubra. The different varieties are common to special localities. Castellani in his researches in Ceylon found that tinea flava is caused by a fungus of the genus *Nocardia* which he called *Nocardia tenuis*. The black variety is caused by the same *Nocardia* in addition to which is a symbiotic, pigment-producing coccus which produces pigment, which is sometimes jet black. This coccus he called *Coccus nigrescens*. The red variety is due to *Nocardia* and a coccus producing a red pigment which Chalmers and O'Connell have called *Coccus Castellani*. The infection is of little or no importance, but European women in the tropics are frequently annoyed by it. A 1 per cent solution of formalin together with sulphur ointment at night is very efficacious. In certain parts of Ceylon practically all of the natives are infected with tinea flava, usually becoming infected at an early age. In most cases the infection remains through life as yellow spots, while in other cases it becomes very diffuse covering large areas. Tinea flava was until recent years considered to be the same as pityriasis versicolor of temperate climates, but Prof. Castellani considers it a separate disease for the following reasons: Tinea flava affects the face more frequently than any other part of the body; it is extremely chronic, developing in most cases in childhood and lasting through life. The fungus named by Castellani *Malassezia tropica* seems to have a permanent disturbing action on the pigmentation of the skin, as, even when the fungus is destroyed, the patches on the skin remain discolored. The treatment is difficult, turpentine and chrysophanic ointment being used on the covered parts of the body. Tinea nigra is due to *Cladosporium* which has black colonies. This



fungus is known to have attacked Europeans. *Cryptococcus epidermica* is due to a fungus which has not yet been grown artificially. It causes brown spots which can be removed with an alcoholic solution of salicylic acid or salicylic-sulphur ointment.

Dermatomycoses due to *Accladium* are found which are very characteristic clinically. In a well-marked case ulcers are present all over the body, the ulcers being sharply defined, oval or roundish and with a red granulating fungus. There is often an abundant yellow secretion which dries leaving yellow crusts. Sometimes gummatous nodules and furuncle-like lesions are found. The course of the disease is long and there is very little tendency to spontaneous healing. Treatment with potassium iodid is usually successful.

The term blastomycosis is applied to a disease due to *Saccharomyces*, *cryptococcus*, *Monilia*, *Oidium* and *Coccidioides*. The clinical appearance may vary greatly and the cases may be divided into three principal groups:

- (1) Cutaneous type.
- (2) Mucocutaneous type.
- (3) Gluteal blastomycoses.

The cutaneous types show verrucose patches with minute abscesses. The mucocutaneous type attacks not only the skin but also the mucosa of the mouth and pharynx, giving rise to patches that are frequently mistaken for a syphilid. They usually yield to potassium iodid treatment. The gluteal variety presents a diffuse induration with numerous openings from which a thin purulent liquid oozes. Fungi of the *Saccharomyces* or *Monilia* type are usually isolated from the pus. The prognosis is most favorable in the skin type, much less so in the other two. Occasionally one may find a septicemia due to blastomyces, even without a skin lesion. These usually terminate fatally.

Dhobie itch is a disease contracted by most Europeans, who reside in the tropics for any length of time. It is characterized by intense itching in the scrotal-inguinal region. It is due to the growth of the fungus *Epidermophyton cruris*. It may also be due to *Epidermophyton rubrum* and a few cases were due to a true trichophyton, *Trichophyton nodoformans*. *Epidermophyton cruris* gives lemon-yellow colored colonies, while *Epidermophyton rubrum* has a deep red color on glucose agar. *Trichophyton* is characterized by the

fact that the surface growth is white and powdery, while the submerged part is of a deep brick-red color. Each species gives a different type of itch. *Epidermophyton cruris* causes the festooned variety identical with *eczema marginatum* of Hebra.

*Epidermophyton rubrum* causes an eczema-like growth, with numerous small papules covered at times with minute bloody crusts. It has a tendency to spread from the scrotal-inguinal region to any part of the body and may, in fact, begin on any part of the body whatever.

*Trichophyton nodoformans* induces an eruption with a thick nodular margin and it attacks the hair follicles. The eruptions in the itch apparently clear up, but the cure is only apparent as it frequently breaks out even after the individual has left the tropics. The treatment consists in the application of salicylic sulphur ointment or chrysophanic acid especially in cases which are inclined to be obstinate.

*Tinea Imbricata.*—This is a dermatomycosis which, though known for a long time, was ascribed to various factors until the researches of Castellani in Ceylon. Castellani showed that the disease was due to *Endodermophyton* of at least four species: (1) *Indicum*; (2) *Tropicale*; (3) *Concentricum*; and (4) *Mansoni*. The disease is especially prevalent in the regions best suited to cocoanut growing and attacks young adults more frequently than children and old people, and men more frequently than women. The disease appears as a brown spot which becomes scaly and splits and in the center another brown spot appears until in time there are a number of concentric scaly rings. The disease has little effect on the general health except a marked itching of the affected areas which can be affected by the diet—however, a diet of dried fish makes the condition very much worse.

The diagnosis is made by removing the scales and microscopically demonstrating the large number of filaments. The disease at first does not affect the general health, but as it becomes chronic and the patient loses sleep, on account of the itching, he becomes nervous, anemic and irritable. The cure is never spontaneous and the disease yields only with difficulty to treatment, consisting of the use of resorcin dissolved in tincture of benzoin, or chrysarobin ointment.

F. HULTON-FRANKEL.

HOWARD, R.: A Note on the Tourniquet in Operations for Elephantitis Scroti. *Journal of Tropical Medicine and Hygiene*, 1920, xxiii, 183.

Despite the use of a tourniquet bleeding seems to create great difficulty in the operation for elephantitis of the scrotum. Howard does not believe that the figure-eight method as recommended by Manson is the best method. He has obtained very satisfactory results by simply winding the elastic cord twice around the neck of the tumor. When the time comes for removal, it is easily removed also. To prevent slipping when the tumor is removed, the towel clips should be inserted into the skin, one on either side, just below the tourniquet. In case towel clips are not obtainable, tissue forceps will answer as well. When it is time to remove the tourniquet, it is necessary to remove only the forceps or grip which is lying on the towel just in front of the pubes. Such a tourniquet cannot slip and in Dr. Howard's experience it has never failed to stop the bleeding. This, he believes, is due to the fact that the pressure is applied directly around the neck of the tumor. Of course, in the early stages of the operation there is always some venous bleeding from the tumor itself, but this can be ignored if the surgeon has complete confidence in the efficacy of his tourniquet.

F. HULTON-FRANKEL.

SANDERS, T. M.: Secondary Meningitis Treated by Intraspinal Administration of Autogenous Serum. Report of a Case. *The American Journal of the Medical Sciences*, Feb., 1920, cliv, Part 2, No. 575, p. 246.

This is a report of a case following influenza, developing bronchopneumonia and, later, meningitis. The moribund pneumonia condition was treated (1) by an infusion of 1000 c.c. of 5 per cent glucose solution; (2) by immune blood transfusion on the second day; and (3) by cardiac stimulation with caffeine, sodium benzoate, digitalin, and camphor oil. The clinical conditions improved until the meningeal infection made headway. Lumbar puncture were performed almost daily. About fifteen days after the first meningeal symptoms appeared, autogenous serum was administered intraspi-

nally. Six days later the temperature was normal and the patient recovered about thirty days later. The autogenous serum is made as follows: Draw off blood from the median basilic vein into four 50 c.c. centrifuge tubes. Separate the clot with a flamed platinum needle and centrifuge slowly. After separation of the serum the tubes are kept in the ice box. Withdraw about 30 to 60 c.c. of spinal fluid, depending on the pressure, and inject the clear warmed (body temperature) blood serum with a 50 c. c. Luers syringe into the spinal canal. Raise the foot of the bed.

Lumbar puncture and administration of the serum should be done morning and night until the temperature drops. Then once a day, and eventually every second day, and then gradually decreased.

Sanders gives the following reasons for its use. Immune serum is brought into direct contact with the inflamed meninges and offending micro-organisms. Immune bodies exist in the serum in practically all infectious diseases. Ordinarily the choroid plexus bars the free passage of immune bodies from the blood to the spinal fluid.

Sanders recommends the use of autogenous serum injected into the subarachnoid space in cases of secondary meningitis when there is no efficient specific immune serum.

A. T. MAYB.

MACFIE, J. W. S.: The Occurrence of Lateral-spined Bilharzia Eggs in Urine. *The Journal of Tropical Medicine and Hygiene*, 1920, xxiii, 45-46.

Report of a case which contained the eggs of Bilharzia (*Schistosoma Mansoni*) in urine. The case was treated with one dose of tartar emetic and cleared up in two months.

F. HULTON-FRANKEL.

EDLAVITCH, B. M.: Cutaneous Reaction to Quinin in Quinin Idiosyncrasy. *The Journal of the American Medical Association*, Dec. 27, 1919, lxxiii, No. 26, p. 1933.

A case is reported in which in a patient of known susceptibility a cutaneous test was made as follows: The skin of the forearm was



scarified in two places, and a 10 per cent watery solution of quinin bisulphate was applied to one, the other counting as a control. After a few minutes itching appeared around the scratch, and a few minutes later an edematous papule appeared, which reached its maximum size of about .75 cm. in half an hour. This was surrounded by a somewhat larger bright red patch of erythema, which began to subside in half an hour, and it entirely disappeared in a few hours. This corresponds to the observations previously recorded by Boerner, and by O'Malley and Richey.

H. G. WEBSTER.

CHRISTOPHERSON, J. B.: Bilharzia Disease. The Sterilization of the Ova during the Course of Cure by Antimony Tartrate. *Journal of Tropical Medicine and Hygiene*, 1920, xxiii, 165-167.

Antimony introduced intravenously is a sure cure for Bilharziasis. Antimony can also be administered in cases not of themselves Bilharziasis, although they arise from it, such as albuminuria, fistulæ, stone and renal complications. Although the emetic may be used in these cases, the dosage must be carefully guarded. The two questions which arises are:

- (1) What is the required dose?
- (2) How is the dose determined?

Dr. Christopherson feels that the presence or absence of ova does not determine the cure, but that this is determined by the condition of the ova excreted. The worms themselves disappear very early in the course of the injections but the important fact is that the ova are sterilized. Usually after the injection of about 10 grains (0.65 grams) of antimony tartrate the ova coming away are sterile. When the ova examined for several successive days are sterile, treatment may then be discontinued as the patient has then ceased to be a carrier. This may not be easy to determine in rectal infections or in some of the mild urogenital infections. In cases in which the antigen is easy to obtain, complement fixation may prove useful. Eosinophilia might be taken as an index, if it were not for the fact that other intestinal parasites produce the same condition. The microscopic test seems to have proven the most reliable. Dr. Chris-

topherson has come to the conclusion, as a result of his long experience, that from 20 to 30 grains (1.30 to 1.95 grams) of antimony tartrate is the average dosage for the adult—more nearly 20 than 30. In uncomplicated cases in which he found no ova in the urine, he has used 25 grains (1.62 grams); in complicated cases less. The administration of antimony tartrate is hazardous as the lethal dose *per os* is very small, about  $\frac{1}{8}$  grain (0.0081 gram), but doses up to 30 grains (1.95 grams) can be given intravenously until all the ova are sterile. If this is not accomplished by this dose, the treatments should be discontinued for a while and resumed later on. The injections call for a considerable amount of judgement and care and a sense of responsibility. As little antimony should be used as is necessary to accomplish the effect on the ova.

F. HULTON-FRANKEL.

DUCKWORTH, D.: "The Diagnosis and Treatment of Tropical Hepatic Abscess." *Journal of Tropical Medicine and Hygiene*, 1920, xxiii, 149-150.

This type of abscess is rarely found in temperate climates except in cases coming in from a tropical climate. There are three forms of hepatic abscesses:

(1) Suppurative pylophlebitis; (2) pyemic abscess—usually multiple; and (3) tropical or amebic abscess. The first two types may be found in any part of the world and are well known. The third type is practically a sequel of amebic dysentery. The leading characteristics of amebic hepatic abscesses are: They are usually solitary or few in number; they may be large and form rapidly; or they may exist for months before urgent symptoms arise.

The course is always latent and insidious, and the abscesses are very infrequent in women and unknown in children. They rarely occur before twenty years of age, usually after twenty-five. The abscess has a tendency to burst and there is a slight jaundice. No enlargement of the spleen is noticed. *Entameba histolytica*, which is the cause of amebic dysentery, is also the causative agent of the abscess. A large impalpable abscess may develop in the liver. The diagnosis of an abscess in a patient who has had amebic dysentery is made upon his general condition. If the patient is toxemic, losing

weight, sallow, listless and has a furred tongue, it is safe to make the diagnosis of hepatic abscess. An exploration of the liver is made with a long trocar which is inserted until pus is found. Treatment consists in irrigating with bichlorid of quinin under which a recovery is generally made. The formation of a hepatic abscess can be avoided by the proper treatment of dysentery. Emetin, administered *per os*, or preferably hypodermically, is specific for the ameba. The diagnosis of abscess is aided by careful comparison of the two sides of the chest and hypochondria. The respiratory movement on the right side is generally impaired and there may be an area of basic and lateral dullness with absent or enfeebled breath sounds over the right pulmonary. These signs alone, in a patient from the tropics with no previous pulmonary trouble, would justify exploration. Sometimes patients arrive in temperate climates and develop pleurisy with cough and wasting. There may be no obvious signs of abscess for weeks. There is no spleen enlargement but there may be a slight jaundice. Pain is commonly felt when the patient lies on the left side. The only satisfactory method of treatment is early diagnosis, combined with the opening and drawing of the abscess. Preparations of cinchona, at first with sodium bicarbonate, and later with nitro-hydrochloric acid, are given during convalescence. Later on ammonium chlorid is given with nitro-hydrochloric acid. With the renewal of the general health of the patient it is safe for the patient to return to the tropics.

F. HULTON-FRANKEL.

THOMAS, T. T.: Brachial Birth Palsy: A Pseudoparalysis of Shoulder Joint Origin. *The American Journal of the Medical Sciences*, Feb., 1920, clix, Part II, No. 575, p. 207.

At birth all shoulder joint injuries are associated with a brachial paralysis, palsy, or weakness of varying degree and duration. Rarely will an actual nerve rupture be found associated with the paralysis, because there will be noted a gradual disappearance of the paralysis in almost all cases. If crippling of the limb does persist into adult life, a posterior dislocation of the shoulder will be found, often associated with the moderate permanent disturbance in the elbow joint. If obstetrical paralysis occurs, a complete paralysis of

the whole limb will follow; it will not be limited to the small Duchenne-Erb group of muscles. This extensive paralysis is explained by the inclusion of the branches of the brachial plexus in an axillary inflammation consequent upon a birth injury of the shoulder-joint. Sufficient traction on the head at birth to rupture the brachial plexus has never been applied in a successful delivery.

A. T. MAYS.

POTOTSKY, C.: The Treatment of Nocturnal Enuresis. *Deutsche medizinische Wochenschrift*, Feb. 12, 1920, xlvi, No. 7, p. 180.

Pototzky does not consider enuresis an affection *sui generis*; in his opinion it is rather a clinical picture, and frequently only a symptom. Its causes are various in nature, physical and psychical. This is the reason that any one method of treatment is not applicable to all cases. One who treats every case psychotherapeutically is bound to meet with as many failures as one who treats every case by means of medication, electricity and bladder washings. There are very few conditions in which individual indications for treatment must be met with as in *enuresis nocturna*.

Some practitioners resort to galvanization and faradization for weeks and weeks. Not only is this procedure not particularly beneficial, but Pototzky has even seen cases which were decidedly aggravated by it. Because this form of treatment induces fear and anxiety in some children, it cannot be carried out at all. The author scarcely ever resorts to electricity or to any other brusque therapeutic measure in children. He does not even believe in "brusque" psychotherapeutic methods; the milder methods of persuasion and suggestion, however, are in many instances very beneficial.

There are some patients who do not seem to tolerate a distention of the bladder, no matter how slight this may be. He instructs these patients to try to retain the urine during the day as long as possible, and to prolong the periods between urination as much as possible. This he calls "Übungstherapie" (exercise therapy), and he finds it to be more advantageous than the method of artificial distention of the bladder.

In cases in which the children wet the bed during the night, because they sleep so soundly that the stimulus of the distended blad-



der does not reach the cerebral centers, he orders the children to be put to bed for a long afternoon "nap" so that they will not sleep so soundly at night.

Pototzky does not think much of W. Weitz's (cited by the author) method of conveying the stimuli, brought about by contractions of the bladder, to consciousness with bladder irrigations with a silver nitrate, because, when this method was not successful, the use of atropin had to be resorted to. The author himself, however, admits that in former years, belladonna, atropin and other sedatives to allay the irritability of the bladder were his main therapeutic agencies. He never employed large doses of the bromids, because these have a tendency to bring about a sleep which is so deep that the patients cannot wake up to empty their bladders.

Recently Pototzky has obtained excellent results with camphor monobromate in the treatment of these cases. As far as he knows, this preparation had never been used before for this purpose. He was led to the use of camphor because it has a sedative effect on the genital apparatus, effecting favorably erections, pollutions, etc. In children he continues the camphor monobromate with calcium lactate.

His favorite prescription for older children is:

Camphor monobromate	0.1
Calcium lacticum	1.0
D ful. dos. No.	xx

*Sig.*—One powder to be taken twice a day.

These powders are given for fourteen days; if necessary, they may be repeated after a two week's rest.

In addition to this form of medicinal treatment, he orders a diet more or less concentrated, water and fluids to be taken mostly during the early part of the day.

M. KESCHNER.

PEARSON, A.: The Use of Quinin in Prophylaxis against Black-Water Fever and Malaria. *Journal of Tropical Medicine and Hygiene*, 1920, xxiii, 177-180.

As a result of his fifteen years' experience Dr. Pearson has found that no person who has taken a prophylactic dose of 5 grains (0.324

gram) of quinin daily has developed blackwater fever and only a few have suffered from malaria. The evils usually ascribed to the taking of quinin, such as dyspepsia, deafness, loss of memory, have been entirely absent. The dosage of quinin as recommended by him in cases of fever is smaller than the dose usually prescribed. He has had the best results with 15 grains (0.972 gram) administered intramuscularly, taking care that the injection is very deep, while 20 grains (1.30 grams) *per os* (5 grains [0.324 gram] every four hours) may be given in those cases in which the intramuscular method is impractical.

F. HILTON-FRANKEL.

GONNELLI, D. L.: Smallpox in the Years 1918, 1919, and 1920 (Il vaiolo negli anni 1918, 1919 e 1920). *Gazzetta degli ospedali e delle cliniche*, June 17, 1920, xli, No. 49, p. 499.

The author, a lieutenant in the Medical Corp of the Italian Army, states that no cases of smallpox were met with in the Friuli Sector of the Italian Front during the period of the war, but after the Armistice 58 cases in all were observed. On the whole the disease manifested itself in a mild form. The epidemic was promptly stamped out by prophylactic measures, which included isolation for twenty days of all those who came in contact with a case, vaccination and re-vaccination, until a positive "take" was obtained, of all the inhabitants of the district, and thorough disinfection of the patient's habitation, clothes, etc. He cites a case to prove that a baby nursed by an infected mother does not acquire immunity against the disease. The baby was vaccinated immediately after the mother was admitted to the Hospital. The vaccination took, but fifteen days after admission the child developed smallpox.

J. B. D'ALBORA.

## SECTION ON LABORATORY AND RESEARCH

ARMSTRONG, C., STORY, R. V., AND SCOTT, E.: Botulism from Eating Canned Ripe Olives. *Public Health Reports*, Dec. 19, 1919, xxxiv, No. 51, p. 2877.

Cases of poisoning now recognized as botulism have been reported since as early as 1735. From 1910 to 1926, inclusive, 3,919 deaths from food poisoning were recorded in the United States. Just what proportion is due to botulism is unknown. The *Bacillus botulinus* was first isolated from ham by Von Ermengem in 1894. It has also been isolated from ensilage and from oat hay and is probably the cause of forage poisoning in animals. In Europe botulism has usually followed the use of poorly cooked meats, sausage, ham, etc. An outbreak at Dernstadt was caused by canned white beans. In America botulism has been most often associated with the use of home-canned fruits and vegetables. Of 64 cases in the United States recorded by Dickson in the past twenty-five years, 54 occurred in California. The outbreak described in this article was due to eating California packed fruit—commercial canned olives. It would appear that olives are especially dangerous, since they are usually served without cooking—a process which destroys the toxin of *Bacillus botulinus*.

The outbreak of the poisoning on which this article is based developed in a group of about 200 people in attendance at a banquet, near Canton, Ohio. Fourteen cases of poisoning occurred, with seven fatalities. A careful study of the foods and their distribution at the various tables placed the blame very definitely on the ripe olives. Among the fatal cases, those generally died first who ate the most olives, and among those who recovered, the severest attacks were, in general, suffered by those who ate the most olives. The

olives were described as peculiar in taste, odor or consistency by various of the diners. None were ill who did not eat ripe olives.

Six olives and a small amount of brine were recovered from the original jar. A careful chemical examination revealed no poison. The subcutaneous inoculation of either brine or an emulsion of a small portion of an olive was fatal to guinea pigs, as were also these substances when fed to them. A sterling filtrate of the brine was also highly poisonous. But this filtrate was harmless after being heated to 80° C. (176° F.) for thirty minutes.

The olives and brine were also cultured successfully for spore-bearing anaërobes, producing a toxin fatal for guinea pigs.

The organism is a coarse bacillus, usually with rounded ends occurring singly, but occasionally in pairs. The organisms are motile but not vigorously so. Under suitable conditions terminal oval or round spores are found, causing enlargement at the ends. The organism stains well in the ordinary dyes, but takes the stain irregularly, giving rise to barred forms. The spores stain more faintly. They are gram-positive, but not strongly so.

Culturally, the organism is a strict anaëroë. It grows best at 37° C. (98.6° F.). Colonies appear in from three to five days on suitable media such as meat infusion agar or meat infusion dextrose agar made slightly alkaline. Cultures have an odor of strong butter or cheese.

Gelatin is liquified at 20° C. (68° F.) in from four to seven days. Litmus-milk is coagulated with decoloration of litmus in from two to three days at 37° C. (98.6° F.). In beef infusion dextrose broth, vigorous growth with gas formation takes place at the end of twenty-four hours at 37° C. (98.6° F.).

Dextrose, saccharose, lactose, and mannite are fermented with gas and acid formation. The different strains of *Bacillus botulinus* differ somewhat in regard to their cultural reactions.

From its morphology, toxin formation, and growth characteristics, together with the symptoms and pathological lesions produced, this organism is considered to be a strain of *Bacillus botulinus*. This opinion has been confirmed by Sisco of Harvard.

The organism was also cultivated successfully with the production of toxin in the brine and chopped ripe olives of the same brand as that of the original jar. The sodium chlorid in the brine (1.67 grams per 100 c. c.) was too little to inhibit the *Bacillus botulinus*.



as the organism will grow on meat infusion dextrose broth, containing up to 6 per cent sodium chlorid. Spores were found at times in nearly all media, but were especially numerous and constant in the olive media.

The organisms are quite resistant to heat. Tubes containing organisms with numerous spores, showed growth and gas formation after being heated to 100° C. (212° F.) for thirty minutes in the Arnold sterilizer. Tubes heated for a longer period at 100° C. (212° F.), or autoclaved at fifteen pounds for fifteen minutes, have shown no growth after fourteen days.

A strong toxin was produced in eight or nine days. This is best produced when grown at 37° C. (98.6° F.), a nine-day culture at this temperature being two hundred times as strong as an eleven-day culture at room temperature.

Alcohol apparently possesses the power of destroying *Bacillus botulinus* toxin. Two patients, who recovered after eating the olives, had partaken more or less freely of alcoholic drinks during the evening. This was also proved experimentally—alcohol in a 32 per cent mixture protecting guinea pigs against 20 times the lethal dose of raw toxin.

*Serological Tests.*—Agglutination with the serum from recovering patients and protective experiments with the serum of those patients with toxin were undertaken, but they failed to show the presence of agglutins or antitoxin. Complement fixation tests were not made.

Experiments seem to show that the *Bacillus botulinus* is unable to develop its toxin in a warm-blooded animal. Guinea pigs injected subcutaneously with culture which had been freed from toxin by heating to 80° C. (176° F.) for thirty minutes were unaffected. It is difficult to free the organisms from toxin by washing. It is not impossible that the organisms might produce toxin in a tonsillar crypt, in a decayed tooth, in the intestinal tract or in other locations where anaërobic conditions might prevail.

*Symptoms.*—The onset of symptoms in only 1 of the 14 cases was on the twenty-third, the day of the dinner, in 6 instances on the twenty-fourth; in 3 on the twenty-fifth; in 2, on the twenty-sixth; in one on the twenty-seventh; and in 1, it was doubtful. Disturbances of vision, diplopia or dimness, difficulty in speech and in smelling, and dizziness and weakness were nearly constant symptoms. Vomit-

ing, constipation, congestion of the throat, ptosis, and dilation of the pupils were common. The temperature was practically always normal. In the 7 fatal cases death occurred in from fifty-four to one hundred and seventy-four hours after the dinner. Respiratory failure was the cause of death in 6 cases. In the seventh it was combined with cardiac failure.

In guinea pigs the onset is usually in from six to forty-eight hours after a subcutaneous injection. The animal sits as though cold, with roughened hair, and sunken flanks. Respiration becomes slow and labored until there is complete diaphragmatic paralysis. There is great weakness. The cornea appears dry and the animal is often unable to wink. The neck is usually completely paralyzed. In other instances the weakness and paralysis seem confined to the posterior part of the body.

*Pathology.*—Two autopsies were performed but microscopical studies were not made.

*Animal Pathology.*—The organs of guinea pigs appeared normal macroscopically except for generalized congestion. This is borne out by the microscopical examination, which shows intense hyperemia of veins especially, but also of arteries and capillaries. Thrombosis of the vessels is very constant. This was pointed out by Dickson who says "Thrombi are so uniformly present and are so characteristic in appearance that they may be considered pathognomonic of botulism".

A marked degeneration of the functional cells of the liver, kidneys, adrenal glands, and heart muscle was also observed.

*Diagnosis.*—The diagnosis must be made to differentiate from other forms of poisoning, such as mushrooms, wood or ethyl alcohol poisoning, in which occur cerebral hemorrhage, cerebral lues, and hysteria. Also it must be made to differentiate from asthenic bulbar paralysis, toxic amblyopias, rabies, diphtheria, plant alkaloid poisoning, ptomaine poisoning, poliomyelitis, cerebrospinal meningitis, trembles, and encephalitis lethargica.

*Prognosis.*—The mentality in different outbreaks has varied from 50 to 100 per cent. In cases which escape death, weeks or months may be required for complete recovery. Weakness is the symptom which is slowest in disappearing. Bronchopneumonia is the complication most to be feared.

*Treatment.*—The following treatments are suggested: Emesis,

or lavage even after several days; active purgation and irrigation of the colon; alcohol, especially early; strychnin, for its effect upon the nervous system; cardiac and other stimulants as indicated; simple nourishing food and water, as long as the patient can swallow; water by rectum, or subcutaneously; antitoxin, if available, but there are no records of its successful use except in animals.

*Prevention.*—(1) A process of canning which effectually kills all spore-bearing organisms. This is difficult to achieve.

(2) Thorough cooking of all canned goods before serving would render foods infected with *Bacillus botulinus* harmless, in so far as the presence of preformed toxin is concerned.

(3) The rejection of canned foods which show even minor change of taste, odor or consistency.

J. B. NEAL.

MASSUR, F. W.: Verminal, a New Insecticide (Verminal, ein neues Ungeziefermittel). *Centralblatt für Bakteriologie*, Feb. 1920, i, No. 84, p. 148.

“Verminal” is a new insecticide whose manufacturers claim that it has neither the dangerous properties of hydrocyanic acid, nor the several disadvantages of sulphur dioxid. It is a light yellow fluid which is burned in an apparatus provided by the manufacturers. Fumigation is carried on for five hours.

As the result of his tests, Massur found that verminal fumes killed lice, bedbugs, moths, nits, gnats, fleas, cockroaches, and mice, with great regularity. The few insects that occasionally survive, often died a day or two later. In the tests, containers of these vermin were placed in drawers, in the pockets of coats, in the seams of mattresses, or they were wrapped in cotton, wool, etc. Bacteria (anthrax, *Bacillus coli*, staphylococcus) were killed.

Clothing, pictures, books, tapestry, etc., were uninjured. Metal surfaces were tarnished, but polishing restored their original appearance. At the end of the five-hours fumigation period, it was possible to enter the room without oxygen apparatus, reach a window, and open it. After a half an hour's airing, one could remain in the room without much discomfort. Only after two nights, however, was it possible to use the room for sleeping.

A. H. EGGERTH.

Buxton, P. A.: Body Lice under Summer Conditions in Mesopotamia. *Parasitology*, 1920, xii, 173.

During the summer months, when the air is very dry and the temperature averages  $105^{\circ}$  F. ( $40.55^{\circ}$  C.), body lice become very scarce and are practically absent. When the temperature becomes lower, they appear again simultaneously with the need for heavier clothing. This reappearance is not due to the development of eggs stored in the heavier clothing as is generally supposed, but to the recurrence of a favorable temperature for the multiplication of the few adults that have survived the heat and escaped the eye of the examining officer.

L. H. GREGORY.

Barach, J. H.: Evidences of Nephritis and Urinary Acidosis. *The American Journal of the Medical Sciences*, March, 1920, cliv, Part III, No. 576, p. 398.

Observations were made to show that severe and prolonged muscular exertion is accompanied by circulatory disturbance sufficient to cause the presence of blood-cells, albumin, and casts in the urine. An individual having normal urine immediately before exercise will, after forty minutes of exercise, have the above-mentioned findings. At a Marathon race of twenty-four miles requiring from three hours and fourteen minutes to four hours and fifteen minutes albuminuria with blood casts were produced in all cases. Out of twenty-four runners, 5 showed showers of casts. Blood-pressure observations showed that albumin occurred in largest amounts in those with the greatest fall in maximum pressure and marked falls in pulse-pressure. Another study was made of 57 normal young men before and after base ball "try-outs" and track races. By the Folin method urinary acidity was found increased to 85 per cent after exercise, but it did not occur more frequently nor was the acidity higher in the severe exertion cases than in the milder ones. There is a positive relationship between the degree of albuminuria and cylinduria and the type of physical exertion; but these observations show that no such relationship can be established between urinary acidity and the occurrence of albumin, casts, and blood cells in the urine. In



the less strenuous type of exertion we usually find an increased urinary acidity, albuminuria and at times blood-cells. Blood-pressure observations and pulse-rate were the same as stated in the previous race.

A. T. MAYS.

GREELEY, H.: Application and Interpretation of the Wassermann Test and of Supplementary Laboratory Procedures. *New York Medical Journal*, Sept. 27, 1919, ex, 546.

In this article Greeley aims to weigh the usefulness of important laboratory methods in connection with the diagnosis and treatment of syphilis in its various stages.

When an individual with an apparently typical primary lesion comes to a physician for advice and treatment, no matter how experienced the physician may be as a clinician, he cannot afford to depend on the finality of his diagnosis on the basis of merely clinical symptoms, but he must utilize every available laboratory or other method to confirm his diagnosis. The most satisfactory evidence of the existence of a disease is the finding of the specific organism connected therewith, and, inasmuch as the morphology of the *Spirocheta pallida* is as typical as that of the Klebs-Loeffler bacillus, examinations of properly prepared smears from suspected chancres should be made in every instance. The author points out the great advantage of prompt diagnosis as a matter of practical import, inasmuch as there is much authority for the statement that lues may often be cured in the chancre stage by two or three arsphenamin injections, and, if the diagnosis is made before the disease has progressed sufficiently to have produced a positive complement-fixation Wassermann test, it may be cured by even a single injection.

According to Greeley, while it is possible to prepare and examine a smear from a chancre without finding the spirochete, or even to confuse with it some other organism, such as Vincent's spirillum, no one who has had any experience in such work is at all likely to fail in finding the spirochete in all primary lesions, as it is abundant therein. The spirochete is also easily detected in all early ulcerations of the mucous membranes; however, in lesions of the mouth and pharynx, it may easily be confused with the common

*Spirocheta microdentium*. The dark field condenser method is the most effective in detecting the specific spirochete.

An individual infected with lues does not show a positive Wassermann test until the spirochetes have spread widely in his system; it is usually from two weeks to two months after an infection before the blood of an untreated patient will give a positive Wassermann test. Craig, cited by the author, reported that 2,575 cases of primary syphilis gave positive results as follows: first week, 34 per cent; second week, 57 per cent; third week, 67 per cent; fourth week, 76 per cent; fifth week, 80 per cent. This test should, however, be made from time to time, to make sure that the disease is not progressing despite any course of early treatment which may have been instituted.

In the secondary stage all untreated cases yield a positive Wassermann reaction. It is well to bear in mind that this reaction is not for specific substances produced in response to the infection, but rather for antilipoid substances which are developed as a result of the large amount of waste products elaborated during active syphilis. For this reason, latent cases, and some cases of congenital lues, frequently give doubtful Wassermann tests. In treated cases the reactions are positive in proportion to the extent and activity of the remaining infection. If, for example, treatment has been sufficient to destroy all organisms except those protected in a localized portion of the body, such as the cerebrospinal system, we would expect the blood to react negatively, as it does. Should treatment be stopped on the strength of such a reaction, the remaining infection may either remain localized, or become generalized again, as is so often seen when a relapse occurs after a short course of antiluetic treatment not followed up by sufficient precautionary tests.

In the light of the author's present knowledge of the disease gained from his laboratory experience, salvarsan (or its modifications) injections seem to be essential in the treatment. Mercurial treatment alone, judging by Wassermann tests, signally fails to eradicate the disease.

In tertiary syphilis with active lesions most authorities have reported that about 90 per cent of the patients show positive Wassermann tests. The author warns that since it is well established that localized late syphilis, such as syphilis of the central nervous system, of the cardiovascular system, or of the liver, may be present and give

a negative or doubtful Wassermann reaction, the clinician must be in a position to correlate clinical and laboratory findings. Other cases of latent syphilis often occur among the inherited infections. In these cases repeated Wassermann tests yielding 1 plus or 2 plus are of great importance; these may be considered positive if corroborated by the presence of clinical symptoms of lues.

The value of the *luetin* test depends upon the number of specific organisms there are in the material employed. If this proportion is large, the test can be relied upon to give pathognomonic response in all cases of lues in which some degree of immunity has developed. A positive luetin reaction could not be expected before this period, inasmuch as such a phenomenon depends upon the presence in the individual of enzymes capable of disintegrating the particular organisms injected; and such substances (enzymes) only appear with developing immunity. That this is so is proved by the unanimity of reports to the effect that the luetin test is of value only in the third stage of active, and in latent and congenital lues. The luetin test must always be checked up by a control injection into the skin of the same medium as was employed to grow the culture from which the luetin was derived. The test is of no value in the case of a person who within a week of the test was taking iodid of potash.

Laboratory tests are of the greatest assistance in the diagnosis of late syphilis, and particularly in neurosyphilis.

Greeley emphasizes the fact that while some authors state that in definite paresis the blood Wassermann test is positive in 100 per cent of the cases, it is universally admitted that in 25 per cent of cases of tabes the test is negative in the blood and positive in about 75 per cent in the cerebrospinal fluid. Spinal fluids, in cases of tertiary syphilis without any nerve symptoms whatever, give positive Wassermann reactions to the extent of about 50 per cent. No case of syphilis is to be considered cured until an examination of the spinal fluid is negative in addition to the negative blood findings.

Spinal fluids for examination by the Wassermann test should, as in the case of the blood, be as fresh as possible, because by keeping even sterile specimens on ice for three or four days, a positive reaction may be missed. Inasmuch as blood serum is usually inactivated (heated) before it is tested for the Wassermann reaction, and this is, as a rule, not done with spinal fluid, it is best that specimens of the latter contain no blood.



The author then goes on to discuss the technic of the colloidal gold test, after which he recalls that this test is of small value in detecting syphilitic infection, *per se*, but since it has been found to give characteristic reactions in almost 100 per cent of cases clinically diagnosed as paresis, it is of the greatest value as an aid in determining whether or not this serious manifestation of lues is developing.

Chronic inflammatory processes of the central nervous system, such as multiple sclerosis and, rarely, tuberculous meningitis and cerebral neoplasm, may give a positive colloidal gold reaction; these conditions, however, can easily be differentiated clinically or by other tests. Some authorities consider the colloidal gold test as the only evidence of neurosyphilis in some cases of latent syphilis. However, while reactions within the syphilitic zone are often corroborative evidences of lues, Miller, cited by the author, cautions that since luetic zone reactions may occur in cases which, after all other tests, and upon the basis of clinical symptoms, are not found to be luetic, definite conclusions from such results in cases known to harbor a luetic infection should not be made.

A cerebrospinal fluid giving a 4 plus Wassermann reaction usually gives a gold sol reaction within the syphilitic zone, but the converse is not true. Cerebrospinal fluids with positive gold sol reaction usually show positive globulin test. The cell-counts in these cases vary considerably.

After describing the *modus operandi* of the Wassermann test, the author points out that there are sometimes unavoidable differences from day to day, in the delicacy of the reagents used. Since it is accepted that the blood of even untreated cases of syphilis in all stages may vary within a few days from a 4 plus to a 3 plus, such a difference in two reports is to be interpreted accordingly, and is not necessarily an index of a change in the pathological condition of the patient.

Positive Wassermann reactions are sometimes obtained from the blood of individuals suffering from other conditions than lues, such as recent chloroform or other narcosis, yaws, leprosy, relapsing fever, malaria, scarlet fever, (lead-poisoning, jaundice—Abstr.), etc. Reports of these findings, however, are contradictory; in some recently published observations the authors claim that in malaria, for instance, a positive Wassermann reaction will not be met with unless the patient is luetic.



Greeley insists that the sooner a specimen of blood is examined after withdrawal the more accurate the result. He has seen some specimens, kept at both room and ice-box temperature, which varied quite considerably in their quantitative reactions.

Specimens in which bacteria have grown are not suitable at all. The ingestion of about 3 ounces of alcohol within twenty-four hours of the taking of the blood tends to invalidate the results; it is claimed that this amount of alcohol is likely to make a weakly positive serum negative.

He appends the following table for the interpretation of the Wassermann test:

<i>Amount of Hemolysis:</i>	<i>Represented by Sign:</i>	<i>Laboratory Diagnosis:</i>
Approximately 100 per cent	—	General syphilis absent.
Approximately 87.5 per cent	+—	Doubtful; next test may give — or +, and diagnosis varies accordingly.
Approximately 75 per cent	+	Suspicious, because such reactions are often obtained in early primary, latent or treated syphilis.
Approximately 50 per cent	++	Positive, if obtained during supposed primary stage, latent or treated syphilis.
Approximately 25 per cent	+++	Positive.
Approximately 0 per cent	++++	Positive.

After a patient has been proved syphilitic he is never to be considered free from the disease until, for a period of two years after the last treatment, he has failed to give a positive Wassermann of the blood (tested every three months) and of the spinal fluid (made at least once or twice). As a final precaution he may also be subjected to the luetin test. In view of certain prevalent notions of the so-called Wassermann fast cases, the author is of the opinion that no person can be considered free from the spirochete as long as a positive Wassermann persists.

He also adds that recently evidence has been adduced which casts doubt on the value of the provocative Wassermann test (injection of 3.086 grains (.2 gram) of arsphenamin and a Wassermann test of the blood made within forty-eight hours after such an injection), as evidence of a cure. The reason for this doubt is that any variation in the reaction given by the blood would have developed without the "provocative" injection, and that usually such reactions as are obtained are minus, plus minus, or 1 plus, and therefore of no value under the circumstances.

M. KESCHNER.

STADIE, W. C., AND VAN SLYKE, D. D.: The Effect of Acute Yellow Atrophy on the Metabolism and on the Composition of the Liver. *Archives of Internal Medicine*, June, 1920, No. 6, p. 693.

A fatal case of acute liver atrophy showed but moderate evidence of acidosis, as determined by the plasma sodium bicarbonate and titratable acid of the urine. The urinary ammonia was high, as was the amino acid content, while the urea was somewhat reduced. This was explained on the assumption that the liver had lost part of its ability to transform amino acid nitrogen into urea nitrogen, one portion being excreted in the form of unchanged amino acids, and another in the form of ammonia.

The blood contained a normal amount of urea nitrogen and two or three times the normal amount of amino acids (0.263 gram per liter). This again points to a failure of the liver to transform amino acids into urea.

The liver was much reduced in weight (1,000 grams), but it contained about the normal amount of water (71.7 per cent). The fat content was over four times the normal (13.5 per cent). The protein was about 15 per cent instead of the normal 20 per cent, while the amino N. was 0.134 per cent, or three times the normal.

The case affords confirmation of the belief that amino acids are formed by autolysis of the liver, and circulate and are excreted as such in unusual amounts in this disease. These observations also support the view that in the deamination of the amino acids and the synthesis of urea the liver bears a part which cannot be entirely assumed by the rest of the body.

T. HOWARD.

LUTZ, B. R., AND SCHNEIDER, E. C.: Alveolar Air and Respiratory Volume at Low Oxygen Tensions. *American Journal of Physiology*, 1919, 1, 280.

The article reports experiments made to determine the alveolar air and respiratory volume under conditions which simulated, so far as time and pressure are concerned, an ascent in an airplane to 18,000 or 20,000 feet. Many of the subjects were maintained at

these levels for periods varying between twenty and one hundred and twenty-seven minutes, during which time the alveolar air or the respiratory volume was followed.

The authors also used the low oxygen tension methods described in previous papers. The results are summarized as follows:

(1) Twenty-four men were subjected to 352 mm. pressure in a low-pressure chamber at a rate equivalent to an ascent of 1,000 feet per minute. In these cases the average alveolar oxygen tension fell 66 per cent, and the alveolar carbon dioxid fell 24 per cent.

(2) The average carbon dioxid tension was definitely lowered at 656 mm. (4,000 feet); this indicates that the onset of increased breathing had occurred.

(3) Alveolar tensions taken during a reduction of pressure to 380 mm. (18,000 feet) at the usual rate, and during the subsequent thirty to one hundred and twenty minutes while the low-pressure level was maintained, showed that, after the preliminary fall in carbon dioxid tension, there was a tendency for this tension to rise for a time, although it remained low during the holding period. After 760 mm. had been reached again within twenty minutes, the carbon dioxid had not recovered its former level in the majority of cases.

(4) The lowest carbon dioxid tension occurred about five minutes after 380 mm. was reached, when the reduction was equivalent to an ascent of 1,000 feet per minute. In some cases this latent period did not occur, and the maximum breathing was coincident with the arrival at 380 mm.

(5) Tensions taken while the pressure was maintained at 428 mm. (15,000 feet) did not show the same profound effects. The carbon dioxid tension did not fall so far, and maintained a level.

(6) Both oxygen and carbon dioxid alveolar tensions responded quickly to rapid successive reductions of barometric pressure to 428 mm.

(7) The per-minute volume of breathing was determined for each minute during a reduction of pressure at the usual rate to 395, 380 and 365 mm. The majority of cases showed a definite increase in ventilation, which took place between 656 and 675 mm. (4,000 and 6,000 feet). This final increase amounted to an average of 54.7 per cent. Individual cases varied from 34 to 103 per cent increase.

(8) The per-minute volume of breathing was determined during

a reduction of pressure to 380 mm. at the usual rate, and during a period of from 48 to 84 minutes while the low level was maintained. In 9 out of 14 cases the maximum ventilation occurred within 10 minutes after 380 mm. was reached. Following this period there was a distinct falling off in the per-minute volume. These cases correspond to the 5 cases out of 9 in which the alveolar carbon dioxide showed a rise after the preliminary fall.

(9) The decrease in the per-minute volume of breathing after the first maximum value, as 380 mm. was reached, was also found in cases in which the low oxygen tension was produced by the rebreathing method and by the Dreyer nitrogen dilution method.

(10) The partial return of the respiration toward the normal is believed to indicate a temporary improvement in condition.

(11) Alveolar air tensions taken during a reduction of the oxygen partial pressure by the rebreathing method, or the nitrogen dilution method, corresponded to those taken under reduced barometric pressure.

W. H. EDDY.

TALLERMAN, K. H.: On the Rectal Absorption of Glucose. *Quarterly Journal of Medicine*, July, 1920, xiii, No. 52, p. 356.

The author undertakes to show by experiments, that rectal injections of glucose in saline are absorbed readily by the rectal mucosa. There has been no exact knowledge on the subject before. Sixty grams (1.9 ounce) of solid glucose were dissolved and increased to 180 c. c. with normal saline. This was injected into the rectum of normal persons as in ordinary rectal feeding. A sample of blood for sugar determination was taken just before the injection. After the injection samples of blood were taken every half-hour for three hours and a final sample at the end of four hours. In 8 cases it was shown that the blood-sugar began to rise at the end of thirty minutes and reached its maximum in about one hour and twenty minutes, the average rise being 0.03 per cent. The blood-sugar settles down to its normal level again about four hours after rectal injection.

About 300 c. c. (10.14 fluid ounces) of a 10 to 20 per cent solution is the maximum of utility, as this is completely absorbed. It has been claimed that when glucose is given with starch it facilitates



absorption, while von Noorden states that dextrin is of the greatest value for rectal feeding. It is cheaper and, since it is a colloid, it is able to be used in higher concentrations and is equally efficacious.

The fact that the blood-sugar begins to rise in thirty minutes, shows how valuable rectal feeding may be in cases of functional and postoperative vomiting.

C. F. NICHOLS.

PRON, L.: Comparative Value of the Analysis of Fasting Gastric Contents and of Test Meals. *La Presse médicale*, June 12, 1920, xxviii, No. 39, pp. 381-4.

A simple physical sign, which permits one to make a diagnosis of a diseased stomach, is clapotage after a fast. Simple tapping may not suffice to elicit this sign. It may be necessary to have recourse to the following variations of technic:

(1) Instead of the recumbent position, the patient should assume a semi-recumbent position, in which the stomach falls and becomes accessible to the fingers.

(2) With the left hand, the lower left anterolateral thoracic region is compressed, while the right hand strikes the left epigastric region, immediately below the floating ribs.

(3) The same method of eliciting clapotage should be employed, with the patient lying on his right side.

(4) The tapping should be done at the end of inspiration when the stomach is lowered by the descent of the diaphragm.

By using this method, the author found clapotage in about 90 per cent of his dyspeptic patients. In the other 10 per cent, the stomach contracts after tapping, possibly because of pain, or it is in a tonic condition.

Every diseased stomach presents clapotage after fasting, or has abnormal contents, or normal contents in abnormal amounts. If, after clapotage has been elicited, the gastric contents are extracted after a fast, the following may be found in the contents:

(1) Pure bile.

(2) Pure mucus—gastromyxorrhœa.

(3) Acid contents, rich in mucus—total acid catarrh—continued hypersecretion.

(4) Acid contents, poor in mucus—incomplete acid catarrh.

(5) Contents, similar to the two preceding types, but containing food residue on microscopical examination—microalimentary retention.

(6) Contents with macroscopic food particles—macroalimentary retention.

Since so many dyspeptics have enough contents in their stomachs after a fast to produce clapotage, it is evident that examination of test meals gives false conceptions of the gastric secretion, since the fluid examined is a mixture of the fasting contents and the test meal contents.

Pure gastromyxorrhoea cannot be detected after test meals, because of the mixture of the mucus with the test fluid.

Microalimentary retention also cannot be detected after test meals have been given.

Test meals, therefore, are of comparatively minor value in diagnosing gastric disturbances. Analysis of fasting contents, however, are of great value in:

(1) Making a differential diagnosis between a frank dyspepsia and a secondary dyspepsia of hepatic origin. In the latter case, pure bile will be obtained.

(2) Make a positive diagnosis of ulcer. After extraction of the fasting contents, 200 c. c. of a 1 per cent acetic acid solution is introduced through the stomach tube. This solution takes up the hematin crystals which are present on the surface of any unhealed ulcer. When the solution is withdrawn, after a few seconds, appropriate tests will demonstrate the presence of hematin, which leads to a positive diagnosis.

(3) Establishing a diagnosis of continued hypersecretion, when clinically the diagnosis was hyperchlorhydria.

(4) Establishing a diagnosis of a gastropathy, in individuals whose symptoms do not point to any stomach lesion.

In the author's opinion, the analysis of the gastric contents is the only means of determining its nature, and cannot be replaced by any other method.

S. KAHN.

GREGOR, A.: The Scope of Certain Disinfectants in the Prophylaxis of Influenza. *British Medical Journal*, Oct. 25, 1919, No. 3069, 523.

Experiments were conducted bacteriologically and with groups of men, and the gases used were  $\text{SO}_2$  and  $\text{NO}_2$ . While the results were not startling, the concentration of the gases in the air was so small as to be neither unpleasant nor toxic. Soldiers and workers were placed in an inhaling room for from ten to fifteen minutes, and apparently the bacterial flora of the nasal passages were altered, and growth inhibited; the secretions were rendered acid, and the men showed a comparative immunity.

L. C. JOHNSON.

APERT AND FLIPO.: Influence of Sex in Different Periods of Life on the Severity of "Grippe." *Bulletin et memoires de la Société medicale des hôpitaux de Paris*, Mar. 11, 1920, xxxvi, No. 9, pp. 321-324.

In the infectious diseases, sex plays no very great part in influencing occurrence or severity. Grip is apparently an exception to this rule.

A statistical study of the mortality in Paris during the epidemic of 1918, shows that death occurred twice as frequently in female as in male patients. This is true not only of adults, but also of infants and children.

Complications, also, were much more frequent among females, and much more severe.

S. KAHN.

ROSENAU, M. J.: Experiments to Determine Mode of Spread of Influenza. *The Journal of the American Medical Association*, Aug. 2, 1919, lxxiii, 311.

To determine the mode of spread of influenza, experiments were performed at Gallops Island, Boston Harbor, by officers detailed from the U. S. Navy and the U. S. Public Health Service. The work was

done on 100 volunteers from the U. S. Navy; the men were mostly from eighteen to twenty-five years old, while a few were around thirty years of age. With the exception of a small number, none of the men had had influenza, or any febrile attack during the winter, as was determined from a careful taking of histories. The few exceptions had shown typical attacks of influenza and were chosen as controls to test the question of immunity.

The preliminary test was the administration of a pure culture of bacillus of influenza (Pfeiffer bacillus) in a rather moderate amount into nostrils of a few of the volunteers. The results were negative.

In the first experiment, 19 volunteers were given large quantities of a mixture of 13 strains of the Pfeiffer bacillus. Some of the strains had been obtained recently from lungs at necropsy; others were subcultures of varying age and source. The material was sprayed with an atomizer into the nose, eyes and back of the throat while the volunteer breathed in. It was estimated that some billions of organisms were used on each man. None of the men became ill.

In the next experiment, virus was obtained from the sick; that is, the secretions were collected from the mouth, nose, throat and bronchi in cases of influenza. This was done by washing out the nose with a salt solution and catching the fluid in a tray. The mucous surfaces of the nose and throat were then swabbed. The swabs were placed in a bottle with glass beads and the material from the tray was added. This material was used on 10 volunteers, 1 c. c. being sprayed into each nostril and the throat while the man inspired. None of the men became ill. Some of the material was filtered and instilled into other volunteers, but it produced no results.

The above material had been collected from distinct foci or outbreaks of the disease. However, because four hours elapsed in the transfer of the material from the hospitals to Gallops Island, it was thought that the delicate virus might have failed to survive this period of time. Therefore, some material was rushed down under special conditions so that only one hour and forty minutes elapsed between the collection from the donors and the inoculation of the volunteers. This time each volunteer received 6 c. c., some of it being swallowed during the process of inoculation. None became ill.

To eliminate the possible ill effect of the salt solution, material



was then transferred by means of swabs directly from nose to nose and from throat to throat. Moist tubes were used to get the material from the nasopharynx. A few of the donors were in the first day of the disease; others were in the second and third. None of the 19 volunteers became ill in any way after the inoculation. They were isolated at Gallops Island, their temperatures taken three times a day and a careful physical examination was made. They were under close medical supervision for one week before release and were then used for some other experiment. All of the volunteers received at least two and some three "shots", as they called it.

Injections of blood from influenza patients were then tried. Twenty c. c. of blood was drawn from each of 5 patients, the lots pooled and treated with 1 per cent sodium citrate. Ten c. c. of the mixed blood was injected into each of the 10 volunteers. None of them became ill.

Mucus material from the upper respiratory tract was filtered through Mandel filters which, while holding back the bacteria of ordinary size, allow ultra-microscopic organisms to pass. The filtrate was injected in 10 c.c. amounts into each of the 10 volunteers. None became ill.

The next experiment was designed to imitate the natural way in which influenza spreads. Ten volunteers were taken to the U. S. Naval Hospital at Chelsea, where 10 patients had been selected as donors. The procedure follows:

A volunteer was taken to the bedside of a patient, was introduced and after shaking hands sat down beside the bed. The volunteer and patient talked for five minutes with heads rather close together. Then the patient breathed out as hard as he could while the volunteer, with his nostrils about two inches distant received the expired breath. This was repeated five times. The patient then coughed directly into the face of the volunteer four different times. The volunteer then moved to the next patient and the whole procedure was repeated so that each volunteer was exposed ten times to fresh cases, none of them ill more than three days. The exposed men were watched carefully for seven days and none of them became ill.

Later in the winter, an outbreak of influenza occurred in the Portsmouth Naval Prison. Volunteers were rushed to Portsmouth and material from carefully chosen typical cases of influenza was

transferred directly to the volunteers. In about thirty-six hours, one-half the number of men exposed became ill with fever and sore throat. Hemolytic streptococci were present and were doubtless the causal agent. All of the clinicians who saw these cases in consultation, agreed that they were ordinary cases of sore throat.

During an attempt to get material at as early a stage as possible, an interesting incident occurred. One of the officers, Dr. L., who had been in intimate contact with influenza from early in October, collected material from 6 healthy men at Portsmouth Navy Yard. It was thought that these men might be in the period of incubation of the disease. None of the 6 became ill with influenza, but Dr. L. developed a clinical attack of influenza in thirty-six hours, although he had previously escaped the outbreak.

Care must be exercised in drawing positive conclusions from the negative results of these experiments. The volunteers may not have been susceptible, but immune. They had been exposed, as all other people had been, to the disease. The outbreak was entered with a notion that the cause of influenza was known and that the mode of transmission from person to person was determined.

J. B. NEAL.

GRAHAM, E. A.: Sodium Carbonate in Chloroform Poisoning. *Archives of Internal Medicine*, June, 1920, xxv, No. 6, p. 575.

The author has previously contended that the toxic effect of chloroform was largely due to the liberation of free hydrochloric acid through the action of oxidation in the presence of water. Animal experimentation described by the author has demonstrated the tendency for the intravenous use of sodium carbonate to protect in some degree against this toxic effect. In the present paper, additional experimental evidence is offered which leads to the same conclusion, and his critics are answered to the effect that while this procedure does not absolutely prevent liver necrosis and renal degeneration, the degree of damage done is usually considerably less in the control than in the experimental animals. In his experiments Graham used Fisher's hypertonic sodium carbonate solution ( $\text{Na}_2\text{CO}_3$ , 10 grams;  $\text{H}_2\text{O}$ , 10 grams;  $\text{NaCl}$ , 14 grams; and distilled water, 1000 c. c.).

T. HOWARD.

BARBOUR, H. G., AND WILLIAMS, H. W.: The Effects of Chlorin upon Isolated Bronchi and Pulmonary Vessels. *The Journal of Pharmacology and Experimental Therapeutics*, Sept., 1919, xiv, No. 1, p. 47.

The behavior of the smooth muscle of the lung in the presence of chlorin may be related to the production of pulmonary edema, an influence being exerted by the changes in the tone of either the vascular or the bronchial musculature. A diminution in the caliber of the pulmonary veins will curtail the blood flow, producing a congestion and edema. Vascular relaxation might contribute to the production of edema if associated with increased permeability of the vessels. The behavior of excised rings of bronchi and pulmonary vessels in the presence of chlorin were investigated.

Isolated sections from the veins, arteries and bronchi relaxed slightly in Locke's solution under the influence of low chlorin concentration, but contracted vigorously in the presence of greater amounts. Medium concentration (300 mg. chlorin per liter) of Locke's solution produced relaxation, followed by constriction. A constriction of the pulmonary veins was produced by 600 mg. per liter. Occurring *in vivo*, it proved distinctly favorable to the occurrence of pulmonary congestion and edema. The measures which tend to relax the bronchi and pulmonary vessels may have a favorable influence upon lungs poisoned with chlorin.

H. M. FEINBLATT.

BARBOUR, H. G.: The Effects of Chlorin Upon Body Temperature. *The Journal of Pharmacology and Experimental Therapeutics*, Sept., 1919, xiv, No. 1, p. 65.

Low concentration of chlorin (from 24 to 30. parts per million of air) produced considerable increase in the body temperature of dogs, whereas medium concentrations (180-200 per million) produced a considerable decrease in temperature with retardation of pulse-rate, which begins to disappear as soon as the half hour gassing is over. Lethal concentrations (800-900 per million) produced a similar fall in temperature, which persisted after the gassing. The pulse became weak and rapid within a few hours, and collapse en-

sued. Collies gassed with lethal concentrations showed marked hyperthermia, which persisted for about two hours, and was followed by early collapse. Death dogs, gassed with lethal concentrations, became poikilothermic, being unable to regulate against either a moderately cool or a moderately warm environment. Inhibitory effects of peripheral nerve irritation upon the temperature centers may contribute substantially to the derangement of the heart-regulating mechanism seen with all the concentrations of chlorin used. In the treatment of gassed cases, it is suggested that an excessively warm environment may be as dangerous as one which is too cold.

H. M. FEINBLATT.

BROWN, W. H., AND PEARCE, L.: Chemotherapy of Trypanosome and Spirochete Infections. Biological Series I. Toxic Action of N-Phenylglycinamid-p-arsonic Acid. *The Journal of Experimental Medicine*, Nov. 1, 1919, xxx, No. 5, p. 417.

The toxic effects of this drug were studied upon mice, rats, guinea pigs, rabbits and monkeys. The authors in conclusion, make the following observations: N-phenylglycinamid-p-arsonic acid (hereafter called "A 63") is one which lends itself well to almost any method of administration and can be given to animals in very large doses. The tolerance of different animal species varies rather widely, but with one exception the reaction of laboratory animals to toxic doses of the drug is of favorable character, that is, toxic effects are confined to doses relatively close to the minimum lethal dose and the recovery of animals from sublethal intoxications is remarkably rapid and complete. This feature of the action of the drug renders possible the repeated administration of even very large doses at comparatively short intervals of time without incurring the dangers incident to cumulative action or to superposition of toxic effects. On the contrary, by taking advantage of this peculiarity of action, it is possible to develop such a degree of tolerance on the part of animals that the dose of the drug administered can be progressively increased to a point well above that which is fatal to the normal animal, and this stands out as the feature of the toxicologic action of A 63. This is of great significance in the use of the drug for therapeutic purposes.

H. M. FEINBLATT.



YAMAKAMI, K.: The Hyperglycemia-provoking Ability of Asphyxial Blood. *American Journal of Physiology*, 1919, 1, 177.

The object of the experiments cited were to determine, if possible, the rôle of adrenalin in the asphyxial hyperglycemia and glycosuria. After reviewing the contributions to the subject made by Cannon, Stewart and other workers, experiments are described in which asphyxial blood was introduced into rabbits to ascertain whether or not it had the power of provoking hyperglycemia. A positive result was obtained. The blood sugar percentage of rabbits so treated almost invariably showed an increase from twenty to thirty minutes after the injection.

Certain factors have been eliminated by the author's experiments; for example, he has shown that the effect is not due to excess of sugar contained in the asphyxial blood. He therefore feels that, while he has been unable to determine what agent of asphyxial blood is responsible, the adrenalin hypothesis is supported by his results. In the future however, some hitherto unknown agent may be discovered to be responsible.

W. H. EDDY.

MYERS, V. C.: Chemical Changes in the Blood in Disease. II. Uric Acid. *The Journal of Laboratory and Clinical Medicine*, May, 1920, v, No. 8, p. 491.

Normally uric acid is present in the blood only in traces, but it is definitely increased not only in gout, but also in certain cases of nephritis. There is no increase in the blood uric acid in rheumatism, such as is found in gout, and this is used as a point of differential diagnosis.

The normal uric acid for healthy adults varies between 1 mg. and 3.5 mg. per 100 c. c. of blood, the differences probably depending in part upon dietary factors. High blood uric acid must obviously depend upon either an increased formation or a decreased elimination. In leukemia the first factor accounts for the increase, but high uric acids in most other conditions find a probable explanation on the latter basis. Among these may be mentioned nephritis, acute and chronic (but not parenchymatous), arterial hypertension, lead

poisoning, bichlorid poisoning, malignancy, acute infection, especially pneumonia, and apparently some cases of nongouty arthritis. Sedwick and Kingsbury have made the interesting observation that the blood uric acid is high during the first three or four days of life, in harmony with the high uric acid excretion during that period.

*Nephritis.*—High blood uric acid values are found in the last stages of chronic interstitial nephritis, with the consequent accumulation of all the waste products of nitrogenous metabolism. Comparative figures on the blood and urine in a case of chronic interstitial nephritis are shown below.

BLOOD ANALYSES mg. to 100 c. c.				URINE ANALYSIS Daily Average in Grams		
<i>Nonprotein N</i>	<i>Urea N</i>	<i>Uric Acid</i>	<i>Creat- inin</i>	<i>Total N</i>	<i>Uric Acid</i>	<i>Creatinin</i>
181	139	6.8	10.0	5.57	0.14	0.37
199	134	12.5	14.5	3.65	0.07	0.29
244	151	15.4	17.7	3.64	0.16	0.17
267	170	21.0	16.1	2.91	0.13	0.13
297	208	27.0	20.0	1.75	0.09	0.15

Very high figures for uric acid may be noted, not only in cases of advanced interstitial nephritis, but also in the very early stages of the disease, before a retention of either the urea or creatinin has occurred. It is suggested that when the symptoms of gout are absent, a high uric acid might be a valuable early diagnostic sign of nephritis. It follows that the uric acid concentration of the blood is a delicate, if not the most delicate, index of renal function at our disposal. Acute nephritis may influence not only the uric acid but also the urea, and, to some extent, the creatinin. It is of interest regarding the uric acid that early in the disease the values observed may be higher than those observed at a later stage, due possibly to a dietary restriction, although during the last days of life the amount may be very markedly increased. In parenchymatous nephritis there is very little retention of acute acid.

*Gout and Arthritis.*—From the normal variations of from 2 to 3 mg. to 100 c. c. of blood, the uric acid may increase to as much as from 4 to 9 mg. in gout, but similar uric acid figures may be obtained in nephritis. However, in nephritis, by means of the phthalcin test, nonprotein and urea nitrogen and two-hour renal test,

some disturbance of renal function can be demonstrated to distinguish it from simple gout. The latter is almost always associated with an increase in uric acid content of the blood, and is of diagnostic value in cases of gouty arthritis, in which tophi containing sodium urate are not already present.

*Influence of Diet and Drugs Upon the Blood Uric Acid.*—A purin-free diet will definitely, although not markedly, lower the blood uric acid. The administration of salicylates and cinchophen results in an increased excretion of uric acid. The action of phlorhizin and methylated purins on the kidney is probably better known but scarcely as remarkable as that of the drugs mentioned. These drugs, by increasing the excretion of uric acid, cause a marked drop in the uric acid content of the blood. In the last stages of interstitial nephritis, cinchophen has little influence upon the excretion of the uric acid, indicating that the renal cells can no longer be stimulated to increased activity.

C. M. ANDERSON.

MYERS, V. C.: Chemical Changes in the Blood in Disease. *The Journal of Laboratory and Clinical Medicine*, March, 1920, v, No. 6, p. 343.

Various methods of chemical examinations of blood have yielded especially helpful information in diabetes, nephritis, and gout, while the data obtained in renal diabetes, infantile conditions, such as tetany and the diarrheal acidoses, in eclampsia, malignancy, cholelithiasis, pernicious anemia, disorders of the ductless glands and various urological conditions, have given us a new point of view regarding many of the disorders.

In discussing various conditions, it is difficult to draw an arbitrary line indicating where normal findings end and pathological findings begin, but it is believed to be safe, when the blood is taken after a fourteen-hour fast (in the morning before breakfast), to regard a urea nitrogen of above 20 mg. and a sugar above 0.15 per cent as quite definitely pathologic, etc.

*Renal Diabetes.*—Blood sugar is normal, and it is only when a knowledge of this fact is at hand that a definite diagnosis of this condition can be made. Here the threshold point of sugar excretion

is below the level of a normal blood sugar. The condition may be regarded as one of glycosuria not dependent upon a temporary increase of blood sugar in an individual free from symptoms of diabetes mellitus. Mild glycosuria occasionally appears associated with parenchymatous nephritis, in which case a mild hyperglycemia may be present.

*Diabetes Mellitus.*—The examination is primarily directed to the determination of the blood sugar, though in advanced cases the acidosis, indicated by the  $\text{CO}_2$  may assume greater significance. Lipemia may develop, and of this the cholesterol is a particularly good index. The hyperglycemia is the most important condition, and the glycosuria becomes less and less of value as the disease advances. In advanced cases, showing nephritis, blood sugar figures may reach from 0.2 to 0.3 per cent or even more, without the appearance of sugar in the urine.

*Gout.*—The blood shows a high content of uric acid, ranging from 4 to 10 mg. Early cases of interstitial nephritis disclose similar figures, although there is generally a tendency for urea retention as well. Since a purin-free diet lowers the blood uric acid, treated gout cases may be encountered where the uric acid is only slightly elevated. Therefore the clinical symptoms and other laboratory findings should be investigated.

*Nephritis.*—Early cases of chronic nephritis show a rise in blood uric acid, although an increase in blood urea is a safer sign of impaired kidney function. Creatinin appears to be more readily eliminated than either uric acid or urea, and it is not, as a rule, until the blood urea has doubled, that there is much increase in this purely endogenous waste-product derived apparently from muscle metabolism. The normal for creatinin is from 1 to 2 mg. per 100 c. c., and figures over 3.5 mg. can be viewed with grave concern, while figures over 5 mg. are almost invariably indicative of an early fatal termination. The possible exceptions to this are cases of retention due to some acute renal condition, such as acute nephritis and mild bichlorid poisoning. All cases of advanced interstitial nephritis are complicated with acidosis, and in some cases this appears to be the actual cause of death. Some acute cases may also show marked acidosis. In parenchymatous nephritis, or nephrosis, the edema is probably dependent, in part at least, on the lowered permeability of the kidney for chlorids with their consequent retention.



Normally, acid phosphate provides one of the most important mechanisms of eliminating acid, and when this phosphate excretion is impaired, bringing about an increase in the (acid) phosphate in the blood (and tissues), an acidosis results, which may be quite as severe as that resulting from diabetic ketosis, judging from the  $\text{CO}_2$  combining power of the blood. In parenchymatous nephritis the nitrogen retention is comparatively small, although there may be a retention of chlorids. Urea nitrogen seldom exceeds 30 mg.

Many cases of advanced malignancy, possibly as a result of toxemia, give the chemical blood-picture of moderately severe nephritis; also certain cases of pneumonia show nitrogen retention. Eclampsia shows neither nitrogen retention nor acidosis, thus showing that the toxemia is not a "uremia". There is a definite fall in  $\text{CO}$  combining power following ether anesthetic.

*Prostatic Observation.*—In cases showing urea nitrogen under 20 mg. per 100 c. c. the operative risk may be considered good as far as the kidneys are concerned. With the urea nitrogen between 25 and 30 mg., care should be exercised. Over 30 mg. shows renal involvement and affords a poor operative risk.

*Cholelithiasis.*—Such wide variations in blood cholesterol is shown that it seems that cholesterol estimation in the blood is not satisfactory in diagnosing cholelithiasis.

*Pernicious Anemia.*—The cholesterol content of the blood is markedly decreased. The therapeutic administration in this condition has, in some cases, been followed by good results.

*Miscellaneous Conditions.*—In diarrheal acidosis of infancy, the  $\text{CO}_2$  combining power has helped in pointing the way to a diagnosis and therapy. Endocrine disturbances have been recognized as associated with a change in carbohydrate tolerance. The sugar tolerance tests are much more reliable with blood sugar determinations than with the urine. In leukemia there is frequently found a marked increase in blood uric acid.

*Differential Diagnosis.*—Renal diabetes must be differentiated from diabetes mellitus, and gout from arthritis. In essential hypertension there may be a marked increase in uric acid, but no urea increase. "Uremia" must be differentiated from apoplexy by negative urea findings.

C. M. ANDERSON.

McCARRISON, R.: The Effects of Deficient Diets upon Monkeys. *British Medical Journal*, Feb. 21, 1920, No. 3086, p. 249.

Monkeys were captured from the jungles. Ten were fed on autoclaved rice, four on autoclaved rice plus butter, and 12 on a more balanced diet; these were used as controls. Those fed exclusively on rice lost 18 grams of weight a day, and those fed on rice plus butter lost weight twice as fast. Loss of appetite was noted. There was vomiting in 4 cases; diarrhea was the most constant symptom, and there was true dysentery in 4 cases. Pathologically, the mucous membrane of the entire tract was the seat of atrophic, necrotic, and inflammatory changes. Other clinical manifestations of disease due to deficient diet were: progressive anemia, diminished sensibility, weakness of the limbs, impaired nutrition of the skin, and enfeebled heart action. It is concluded that diets deficient in vitamins and protein, but rich in starch or fat, or both, are potent factors of disease, and especially of gastro-intestinal disease. An excess of fat, and starch with a deficiency of B-vitamin, and protein, are especially harmful to the organism. These deficiencies greatly favor the invasion of the blood and tissues by bacteria. Complete deprivation of B-vitamin, with an imbalance of other food requisites, will lead to rapid dissolution and death; subminimal supply of this vitamin under like conditions will lead to slow dissolution and disease.

L. C. JOHNSON.

Morr, F. W.: Normal and Morbid Condition of the Testes from Birth to Old Age in One Hundred Asylum and Hospital Cases. *British Medical Journal*, Dec. 6, 1919, No. 3075, p. 737.

In 66 cases of general paralysis spirochetes were found in the brain emulsion, but none were found in testicular emulsions from 50 cases. This fact is correlated with the fact that general paralytics have healthy children, unless the wife is infected. In dementia precox regressive atrophy of the testes was noted in all stages, and was complete in one-half of the cases. It is possible that this regressive atrophy may be correlated with a deficient vital resistance, and with the morbid changes in the brain.

L. C. JOHNSON.

## SECTION ON PEDIATRICS

LASSALLE, M.: Contribution to the Study of Bronchopneumonia of Infants and Its Treatment (with Ether). *Archives de médecine des enfants*, Paris, July, 1920, xxiii, 414.

Bronchopneumonia is chiefly a disease of infants and the aged, and is practically always secondary to other conditions, frequently acting as the last straw in causing death. Armand-Delille reported a 50 to 70 per cent mortality among infants in hospitals. Weill believes that death is the rule in babies under one year, is probable during the second year, occurs in 3 out of 4 cases during the third year, and in 1 out of 6 cases after the sixth year. Bronchopneumonia is rare among the well-to-do; it is a little more frequent in badly ventilated homes and is also rare in hospitals where children are properly isolated.

There are two types. The most frequent type results from a direct descending infection of the respiratory tract, the other type results from infection from septic emboli. The latter type may occur from the swallowing of sputum which passes into the intestine, infecting the mesenteric glands. The infection then spreads to the bronchial glands and finally affects the lung. At autopsy the central focus of infection is usually found to be a bronchiole from which the process spreads in much the same manner as anthrax infection commences with a malignant pustule.

The therapy usually employed is oxygen and cardiac tonics, but as the former is expensive and difficult to procure, Lassalle advises the subcutaneous injection of 1 c. c. of ether every four hours in severe cases, or at night and in the morning in milder cases, until the temperature reaches normal. Frequently one injection is suffi-

cient. The author started this therapy as a heart stimulant, but he now believes that it also acts as a lung antiseptic, for ether is excreted by the lung. Ether penetrates all through the lung, while oxygen cannot penetrate the consolidated areas. Ether also acts as an antispastic and reduces the temperature. The earlier it is administered, the better. The author advises that it be given in cases of measles and whooping cough when there is the least suspicion of lung involvement. In tuberculosis it has no effect.

During the repatriation of the refugees at Thonon-les-Baines, Lassalle treated with ether a large number of children with bronchopneumonia. These patients ranged in age from two and one-half to ten years; there was a total mortality of but 4 or 5 per cent. He noticed no bad effects in over two hundred injections. The only possible reactions to ether are excitement and inebriety.

W. C. DAVISON.

TERRIEN, E.: The Romance of the Milk Tolerance Test and Its Value in Choosing a Diet for an Infant. *Archives de médecine des enfants*, Paris, July, 1920, xxiii, 404.

According to Finkelstein and his pupils and following the conceptions of Parrot, different types of indigestion, e. g. *simple dyspepsia* (fat or albumin intolerance), *dysthrepisia* or the *dyspeptic state* (carbohydrate intolerance), and *athrepisia* (total intolerance for fat, carbohydrates and salt), are only progressive stages of the same process of "decomposition".

The examination of stools, according to Finkelstein and Combe, is useless and misleading in attempting to differentiate these three types. The administration to infants with suspected nutritional disturbances of an increased quantity of cow's milk and the observation of their reactions have been advocated by German authors as a means of diagnosis of these types of indigestion and as an indication of the proper diet to give these children. If the infant is normal or merely undernourished with normal digestive tolerance, this increase in food will result in an increase of weight (orthodox reaction). If this increase in the amount of cow's milk does not produce an increase in the infant's weight and causes calcium soap stools (paradox reaction of the first degree), the diagnosis is simple dyspepsia (fat or al-



bumin intolerance). If a slight diminution of weight is produced and the child has a subfebrile temperature and numerous watery stools (paradox reaction of the second degree), the condition is called dysthropsia, or the dyspeptic state (carbohydrate intolerance). If the increase in milk causes a paradox reaction of the third degree, i. e. marked loss of weight, subnormal temperature and frequent watery stools, athropsia, or decomposition proper, complete intolerance of fat, carbohydrates and salts is indicated.

This method of diagnosis is supposed to be more precise, if, instead of immediately increasing the amount of milk, two tests are made, i. e. if milk is administered in amounts less than seventy calories per kilogram of the infant's weight and later in amounts varying from seventy to one hundred calories per kilogram weight. Both of these methods will produce a paradox reaction in infants with athropsia; in infants with dysthropsia the reaction will be orthodox with a milk diet of less than 70 calories per kilo, and paradox with amounts of from seventy to one hundred calories per kilo; while in infants with simple dyspepsia the reaction will be orthodox with both diets. In a normal infant the tolerance is elastic and the reaction is orthodox, but a child with digestive disturbances has a much more limited tolerance and his reaction may be paradox.

It is necessary, however, to distinguish a quantitative and a qualitative, or elective, intolerance. There is no relation between these two types. A milk tolerance test may correctly indicate that an infant can only take a limited amount of cow's milk (quantitative intolerance), but it will not show whether he has an intolerance for this or that food substance (qualitative intolerance).

From the degree of severity of the paradox reaction, the German authors diagnose an intolerance for fat or an intolerance for carbohydrates or a complete intolerance for fat, carbohydrates and salt. Terrien's experience, however, does not confirm these conclusions. He states that infants with dyspepsia have more or less intolerance for milk, and that the reaction should always be paradox. Furthermore, some patients who have given a paradoxical reaction of the second degree and whose conditions are therefore diagnosed as cases of dysthropsia (carbohydrate intolerance), may improve rapidly on a carbohydrate diet. Some patients who give a paradoxical reaction of the third degree and whose conditions are diagnosed as athropsia with complete intolerance for fat, carbohydrates, and salt,

will rapidly recover on a proper diet of these substances. In other patients, in whom the milk tolerance for fats and carbohydrates is indicated, all that is necessary for recovery is a change of diet from the milk of one cow to that of another, or a change to woman's milk or to ass's milk. An intolerance for cow's milk does not necessarily indicate an intolerance for the fat, carbohydrate and salts of other varieties of milk.

As a matter of fact the milk tolerance test was not original with Finkelstein, but with Parrot in France, and it served in the diagnosis of the more or less complete loss of assimilation in cases of athrepsia. In some patients with athrepsia the digestive disturbances may have disappeared and the stools may be normal, but the power to assimilate may be lost. Increasing the amount of food will not change the aspect, but the child will continue to lose weight. Furthermore, in some cases of proven athrepsia, the reaction to the milk tolerance test may vary, on one day giving the reaction diagnostic of dyspepsia, on the next the reaction of dysthrepsia, and on the third of athrepsia. To prove that the loss of assimilation is more or less complete it is necessary to try the effect of different diets, for from an intolerance for milk a diagnosis of a general intolerance for other foods is not justifiable.

Inasmuch as diagnoses of intolerance for different food elements based on reactions to milk tolerance tests are erroneous, the method is of no value in choosing a diet for infants. Terrien advises that the method be discarded because it is capable of aggravating the nutritional disturbance.

W. C. DAVISON.

MACKAY, C.: Medical Treatment of Infantile Paralysis. *The British Journal of Children's Diseases*, 1920, xvii, 1.

Mackay thinks that the prodromal or acute febrile period is the most important stage of the disease from the point of view of the community, for upon its recognition depends the possibility of controlling the infection, and it is only in this period before an extensive destruction of nerve-cells takes place that one can ever hope to make treatment thoroughly efficient. Early diagnosis in this disease is imperative and is an essential part of treatment. The author refers

to Batten who advances lumbar puncture in the pre-paralytic stage, not only as a method of diagnosis but also as a means of treatment. Mackay advises serum therapy, but he feels that satisfactory results of serum treatment still appear to be very open to question. Isolation and disinfection of discharges, with cleansing of the nose and throat with some neutral or mild antiseptic lotion, are procedures to be strongly advised. The outstanding lines of treatment are complete anatomical rest and muscular reëducation. It must be immediate; it admits of no delay because the disease at once destroys muscle adjustments, and so fine are these that as soon as the nerve-cell governing the action of a flexor, for example, is affected, its extensor opponent begins to overact. No definite time can be set as to when muscle reëducation should be begun, but one can be guided by the presence of pyrexia, pain and tenderness; until these conditions disappear, it is best to keep the limbs at rest. The great underlying principle is to pick up a minimum function and to use it as the commencement. There is a zero position of muscle function for every muscle and muscle group; reëducation must be commenced in this position and carried on patiently and skillfully during the next two years at least. For any affection of the lower limbs Mackay advises a complete rest in bed for about six weeks.

M. B. GORDON.

GUNewardENE, T. H.: A Case of Leukemia with Scalp Nodules.  
*The British Journal of Children's Diseases*, 1920, xvii, 9.

A boy, aged 3 years and 4 months, with an apparently idiopathic severe anemia of 11 per cent hemoglobin and 760,000 red cells, responded, as evidenced by his general condition and blood-picture, to treatment in five weeks. Then he contracted measles, and about three months later developed nodules, mainly in the scalp. At the same time he exhibited a different blood-picture which was most unusual, because he showed a hemoglobin percentage of 72, red cells of five and a half million, together with what is regarded as myeloblasts. Without treatment some of the nodules disappeared and others became smaller, but with a reduction of the red cells and the hemoglobin content. At the beginning of treatment, the temperature shot up and a soft tender tumor developed. The treatment was then

discontinued for a fortnight; then it was resumed owing to the steadily increasing anemia, but with no evidence of any improvement; eventually, with all the accompaniments of any severe anemia, death ensued. As an unusual occurrence tender hyperemic swellings occurred at the lower ends of the bones (tibia and right femur) which subsided in a few days. There was also gradual enlargement of the nodules with the decline of the patient's vitality; some of these disappeared twenty-four hours before death. The diagnosis of leukemia is almost entirely based upon the presence of abnormal cells in the blood practically replacing all the other cells. The author considers the case as one of the myeloid variety because of:

(1) The extreme rarity of lymphatic leukemia or lymphamia in childhood.

(2) The presence of morphological myeloblasts in large numbers.

(3) The presence of apparently the same premature type of cell to the extent of nearly 100 per cent in the bone marrow, and to a lesser extent in the spleen.

M. B. GORDON.

RETHREFORD, W. J.: Cardiac Angina in a Child of Six Years.  
*The British Journal of Children's Diseases*, 1920, xvii, 22.

A boy, six years old, suffered from a dry pericarditis and from numerous anginal attacks from the onset of his illness. There was no history of any rheumatism, chorea, joint pains or no signs of any local tenderness. The pain, though it was described as occurring most often in the upper abdomen, was not infrequently referred to the outer aspect of the left upper arm at or near the insertion of the deltoid-muscle, a part the child would apprehensively grasp during the continuance of the pain. The paroxysms were rather intense. During the course of the treatment, there was no further recurrence of these attacks. It is difficult to say whether the cessation of the attacks was due to a favorable development of the case or to energetic action in combating intestinal toxemia.

M. B. GORDON.



SECTION ON  
ROENTGENOLOGY AND ELECTRO-  
THERAPEUTICS

COLLECTED ABSTRACT OF THE LITERATURE ON  
ROENTGENOLOGY FOR THE YEAR 1919

By I. SETII HIRSCH

ORGANS OF DIGESTION (GASTRO-INTESTINAL TRACT)

(Continued from page 868)

*Esophagus*

W. Hill (Discussion on Dilatation of the Esophagus without Anatomical Stenosis [the So-called Cardiospasm]. Proceedings of the Royal Society of Medicine. Section on Laryngology, March, 1919, xii, 33) states that the site of the stenosis is not really at the cardia, but at the level of the diaphragm, where the gullet is embraced by the crura, which constitutes a potential extra-esophageal sphincter. For this and other reasons, this observer has discarded the term "cardiospasm".

The various hypotheses of the cause of this condition are discussed, and it appears to be uncertain whether it is a primary or a secondary condition. None of the hypotheses are altogether satisfactory.

In well-marked cases of esophagectasis the x-ray appearance is constant, the opaque meal being arrested at the phrenic level and not passing immediately into the stomach. The same appearance is, however, seen in fibrous stricture and other forms of true anatomic stenosis of the phrenocardiac gullet, although the dilatation of the gullet is here greater than in any form of organic stenosis. The differential diagnosis can only be certainly made in all cases by endo-esophageal inspection of the phrenocardiac tubes. When a soft rubber bougie of large caliber filled with mercury is seen under the

fluorescent screen it passes without hindrance into the stomach. This test can be relied upon as pointing to the absence of an organic stricture; but if the gullet presents a truncated and lobulated dilatation at the phrenic level, the nose of the bougie may fail to find the entrance to the phrenocardiac gullet; the test then fails to differentiate between a functional and an organic stricture in this region, and this the author believes shows the superiority of the esophagoscopic method as a certain means of diagnosis applicable to all cases.

As functional stenosis has been held to be due to paresis, it might be expected that the therapeutic application of electricity would supply some information. The faradic current, however, only acts on striped muscle, which does not extend much beyond the upper third of the gullet, and the use of the galvanic current is contraindicated in a moist tube like the gullet because of the danger of electrolytic action. **The sinusoidal current is safe.**

During the past year, W. Keppler and F. Erkes (Roentgen Diagnosis in Diverticula of the Esophagus [Zur Roentgendiagnose der Speiseröhre] *Medizinische Klinik*, Berlin und Wien, 1919, xv, No. 20, p. 480) observed 2 cases of esophageal disease in which the roentgen examination showed a diverticulum, but in which the operation disclosed that the pathological process was a cancer. The authors then investigated the literature and found that in 250 cases reported, the roentgen diagnosis had erred in 3.6 per cent. While this result does not lessen the value of the roentgen rays, it must be borne in mind that in stricture processes of the esophagus of various etiology, the x-ray may present an appearance which cannot be differentiated from a genuine diverticulum.

### *Stomach*

M. Haudek (Contribution to the Pathogenesis and Diagnosis of Gastric and Duodenal Ulcer [Ein Beitrag zur Pathogenese und Diagnose der Magen und Zwölffingerdarmgeschwüre], *München Medizinische Wochenschrift*, 1918, lxxv, No. 32) states that an analysis of the roentgenological phenomena observed in gastric and duodenal ulcer leads him to the following conclusions:

(1) In the early stages the roentgen examination shows motor and secretory irritation phenomena, which occur also without ulcer in purely nervous disturbances. The differential diagnosis is dif-

ficult and the question whether these irritation phenomena are produced reflexly by the ulcer or whether they must be considered as primarily neurogenous, cannot be decided by the roentgen examination alone.

(2) The stomach reacts to the induced irritation always with an increased constriction. The varieties of reaction, or the type of the increased contractibility, depends upon the particular form of the stomach which the individual possesses.

The knowledge that the roentgenological signs of ulcer are to a certain extent resultant phenomena from a disturbance in the vegetative nervous system, demands that the roentgenologist and the clinician have a knowledge of pathology, especially of pathological histology. Perhaps it will then be possible to replace the terms "nervous disposition," "neurosis," etc., with the names of well-defined diseases of the vegetative nervous system (centers or tracts, vagus and sympathetic nerve), or of the nerve endings, which manifest themselves primarily by irritation phenomena (stomach, intestines, heart, etc.). Haudek thus indicates that the ulcer may be the result of the irritation which has its origin in a nervous disturbance.

Schütze (A New Radiographic Sign of Gastric Ulcer, *Berliner klinische Wochenschrift*, Nov. 4, 1918) believes that the presence of indentations on the greater curvature has not been correctly interpreted.

The author distinguishes four grades of indentations: shallow, medium, strong, and very strong. These appear to be fixed and do not move with the peristaltic waves. They are more or less apparent during examination, showing especially well when pressure is applied on the sensitive point.

This finding is present only when the painful point is on the upper half of the left border of the stomach or the duodenum.

It is present in 60 per cent of the cases of ulcer.

The indentations are attributed to a hypertonic state of the stomach, due to irritation from a gastric or duodenal ulcer, which causes the mucous membrane to plicate transversely. They have the same significance as the deep incisura due to spasm, except that the latter form is located opposite the point of ulceration.

In some instances the indentations appear in cases of cholecystitis and this must be remembered in the differential diagnosis.

The indentations must not be confounded with perigastric adhesions, which can be easily eliminated by active or passive movement of the stomach, and by examining the patient at different angles. The latter reveals that sometimes the indentations extend on the posterior surface.

In the presence of indentation one may assume that an active ulcerating process of the gastric or duodenal walls is also present.

F. H. Baetjer and Julius Friedenwald (Certain Aspects of Peptic Ulcer with Special Reference to Roentgen Ray Diagnosis as Observed in a Study of 743 Cases, *Johns Hopkins Hospital Bulletin*, August, 1918, xxix, No. 330) first studied the cases clinically and then, without any knowledge of the clinical examination, a roentgen ray examination was made. The two reports were compared in order to determine how closely the clinical and roentgen ray diagnoses corresponded.

The 743 cases examined were divided into three groups:

*Group I.*—Cases proven at operation, 185. Diagnosis proven.

*Group II.*—Cases presenting positive clinical and roentgen ray findings of gastric ulcer, 323.

*Group III.*—Cases presenting doubtful signs and symptoms, but lacking some definite, positive sign, but in the larger number of which, however, roentgen ray findings were quite definite, 235.

Group I was the most important in this series because the diagnoses were definitely confirmed by operation. There were 185 patients in this group, 132 were males and 43 females, varying in age between twenty and forty.

A direct history of ulcer was present in 163 cases (88 per cent), with occult blood in 108 cases (84 per cent). A chemical analysis was made in 164 cases. There was a high percentage of hyperchlorhydria in this series of cases. This is due to the fact that the Rehfuess fractional method was employed.

Of these 185 cases, which were definitely checked up by operation, the roentgen ray findings were verified in 147 cases (79.4 per cent). Of these 147 cases, the ulcer was duodenal in 68 (46.2 per cent); gastric in 53 (36 per cent); pyloro-duodenal in 17 (11.6 per cent); and undetermined in the remaining 8 cases (5.4 per cent). The roentgen ray diagnosis in these 8 cases was based chiefly upon the functional activity of the stomach and not upon a persistent filling defect.



In 38 cases (20 per cent) of this series, the roentgen ray findings were either not characteristic or they pointed to other conditions.

In Group II are included those cases which presented typical clinical signs as well as positive roentgen ray findings of ulcer, so that the diagnosis was not in question.

There were 323 cases in this group.

Roentgen ray findings in this group were even more definite than in Group I. Of these 323 cases, positive roentgen ray findings were obtained in 272 (84 per cent). Of these 272 cases, 117 were duodenal ulcers (43 per cent); 109 gastric ulcers (40 per cent); 38 pyloro-duodenal ulcers (14 per cent); and in 8 (3 per cent) the location remained undetermined. A filling defect was absent in the 8 undetermined cases; but here, too, the functional activity of the stomach was so definite that a positive diagnosis of ulcer was made with almost absolute certainty.

In this group there were 51 cases (15.6 per cent) in which the roentgen ray findings were either uncertain or pointed to some other pathological condition.

In Group III the authors have placed those cases in which there were some elements of doubt, yet which, on the other hand, presented many of the characteristic manifestations of ulcer.

Though the presence of a single duodenal ulcer can always be eliminated, gastric ulcer cannot be. The main distinction lies in the fact that in an irritating lesion of the stomach, such as ulcer, the consequent hypermotility produces a rapid emptying of the stomach.

In simple ulcer of the duodenum, uncomplicated by adhesions the stomach empties in from fifteen minutes to an hour, the contractions are uniform, and there is no tendency toward hour-glass formations. The pylorus is patulous and bismuth flows through quite freely. The duodenum is in very active contraction and in many cases deformity is visible in some portion of it. At times the defect can be seen between two bismuth currents which can be seen running along either side of the defect.

In gastric ulcer just the reverse is seen. Primary quick expulsion of contents and then the spastic condition of the pylorus appear with hour-glass formation and retention, lasting anywhere from four to six hours, depending upon whether the lesion is simple or complicated by adhesions. In addition, a filling defect is usually observed; this remains constant.

The greatest difficulties arise in the diagnosis of complicated cases: that is, when adhesions are present, due either to the healing ulcer, or to inflammations connected with one or other of the organs in the abdominal cavity. This condition so frequently masks the usual findings that it is often impossible to determine whether we are really dealing with an ulcer, or whether a lesion of some organ is causing the symptoms, or whether the gastric findings are due to a purely reflex condition or to a spasm.

Although ulcerations are not always revealed by roentgen ray examinations, there are many cases of ulcer doubtful from a clinical standpoint in which the ray will clear up the diagnosis. In 2 of these cases the clinical signs were indefinite but suggested an appendicitis; the roentgen ray was definite as to ulcer in both instances. Appendectomy was performed and only temporary relief was afforded. There was subsequent gastric hemorrhage and finally operation revealed an ulcer in each instance.

Douglas (*Carcinoma of the Stomach, Surgery, Gynecology and Obstetrics*, 1910, xxviii, 76; referred to in *Progress Medical Science*, p. 848) states that the considerable but not tabulated reports of cancer in a small area of the edge of an ulcer, is proof positive that the change does occur. The evidence that cancer develops from chronic irritation and ulcers in other localities, adds probability that the same metamorphosis occurs in the stomach. Those who are opposed to the theory of carcinomatous degeneration of a large percentage of ulcers, nevertheless agree that a previous ulcer history may be obtained in from 5 to 17 per cent of cases; they also agree that ulcers may perforate without previous symptoms and that a long ulcer history is not against the presence of cancer. Hence it seems at least a fair presumption that ulcer preceded cancer in a larger percentage of cases than the figures of the above writer indicated. The strongest presumptive evidence against carcinomatous degeneration of ulcers is the results after gastroenterostomy. The rapid healing which usually occurs in ulcers near the pylorus after this operation is striking. The theory of possible inhibition of cancer formation after gastroenterostomy, according to the theory of Gressot, is based on the theory of the possible digestion of sloughing carcinoma. The claim that a large percentage of cancers originate in ulcers does not mean that a large percentage of ulcers necessarily become malignant. The following facts are not contested:

- (1) The mortality without operation is 100 per cent.
- (2) The percentage of deaths from cancers of the stomach in the total death-rate is 1 per cent.
- (3) More than 30 per cent of all cancers occur in the stomach.
- (4) Of late years the statistics at the large clinics show an operability of 38 (Mayo) to 39 (Bloodgood) per cent of cases coming to the surgeon.

Gastric ulcers are potentially cancer and a diagnosis macroscopically in the early stage of malignant development cannot be made; therefore, an old callous ulcer in a patient of the cancer age should, when possible, be excised. If it is small and not regarded as malignant, then and only then, may it be destroyed by the cautery method, and a gastro-enterostomy done; otherwise a transgastric resection or pylorotomy should be performed whenever it seems even possible that carcinoma has begun at any point in the margin of the ulcer.

R. D. Carman, (The Operability of Cancer of the Stomach as Determined by the Roentgen Ray, *Journal of the American Medical Association*, Nov. 15, 1919, lxxiii, No. 20, p. 1513) states that without the use of the roentgen ray a positive diagnosis of cancer of the stomach is made when cachexia, loss of weight, achlorhydria, obstruction, Oppler-Boas bacilli and a palpable tumor are noted; gastric cancer is well advanced in its development.

But the syndrome of early cases of cancer of the stomach is not sufficiently characteristic to differentiate it from that of other gastric diseases. But by the roentgen ray an indication for operation is shown in the location and extent of the filling defect in the gastric contour, 95 per cent of all tumors of the stomach being cancerous. Early diagnosis seems to be the surest preventive of a high gastric cancer mortality; the roentgen ray has often proved to be a means of diagnosis and of forecasting the operability of carcinoma of the stomach at a time when clinical symptoms are so slight as merely to hint at malignancy.

If the roentgen ray examination reveals a tumor of the stomach, screen and plate findings should be studied with one purpose in mind—possible cure by operation. The chances for cure, which the particular case possesses, place it, according to the roentgen ray evidence of operability, in one of three groups: operable, border-line or inoperable. The limits of each group are roughly marked by the roent-

gen divisions of the stomach: Group I, tumors of the pars pylorica, the operable zone; Group II, tumors of the pars media, the questionable or border-line zone; and Group III, tumors of the pars cardiaca, the definitely inoperable zone.

**OPERABLE TUMORS.—Group I.**—In Group I are those tumors which are located in the pyloric end of the stomach; these are shown by the roentgen ray to be operable so far as the stomach is concerned. In this type are included those cases in which the lesion has not spread far on the stomach to the danger zone of the pars media. As approximately 70 per cent of all gastric cancers occur in the pyloric end of the stomach, and as about 95 per cent of all lesions which encroach on the gastric lumen are carcinomatous, a lesion in the pyloric end should always make one strongly suspicious of malignancy. The character and size of the filling defect may also give some hint of malignancy; but this question is of no importance from the standpoint of the possibility of operation; that depends upon the amount of healthy stomach wall remaining.

Often cases which present clinically such severe symptoms as to seem inoperable prove operable on roentgen ray examination, for even a large palpable tumor may be resected, if it is confined to the lower half of the stomach. While a palpable tumor does not, therefore, prevent operation, it does mean that the lesion has existed for some time and that metastasis may be present. Free motility of the cancerous stomach favors resectability, but signs which point to it may also be misleading. The filling defect may be atypical of cancer and the clinical symptoms alone may offer little explanation; but if the patient who has indefinite gastric symptoms has any filling defect in the contour of the stomach, whether typical or atypical of cancer, the chances are that malignant growth is present. A lesion of the stomach can be pronounced operable, however, only with respect to the stomach, as perforation and metastasis almost invariably remain undiscovered until after incision.

**BORDERLINE TUMORS.—Group II.**—These are the tumors which extend so far up the stomach wall, into the questionable zone, that their resection becomes uncertain. These cases present a most puzzling problem as to operability from a roentgenological standpoint. Their removal depends, as in the cases of Group I, on the possibility of metastasis, plus the judgment and skill of the surgeon. The position and size of the stomach may be a surgical drawback; the



small high-lying stomach of the robust person offers much greater difficulty to the operator than does the relaxed stomach of the asthenic person. Therefore, if the roentgenologist is familiar with the surgeon's technic, he can better form his decision as to the operability of the particular case than if he knows nothing of the operator's dexterity and willingness to attempt a resection when the tumor lies in the border-line zone of the stomach.

**INOPERABLE TUMORS.—Group III.**—These are the gastric tumors which are pointed with finality by the roentgen ray as inoperable. The tumors of this group are located in the cardiac end of the stomach, or they have spread from a pyloric or fundal carcinoma to within this inoperable zone. Surgery can bring no relief to the patient when the cardiac end of the stomach is cancerous. The tumors in this region of the stomach are easily recognized by the roentgen ray as inoperable.

**VALUE OF THE ROENTGEN RAY.**—Of recent methods which have so far been adapted to discover the cancerous growth and to prophesy the chances for its removal, the roentgen ray signs, when correlated with clinical findings, seem to be the most promising means by which operability may be increased through earlier diagnosis. So many seemingly benign lesions of the stomach prove to be malignant that the advisability of medical treatment instead of operation seems very questionable, or even homicidal. Periodic roentgen ray examinations in a suspected case can, of course, be made; but if, instead of retrograde changes, a filling defect typical of carcinoma is noted in time, attempted operation may be too late because of metastasis.

(To be continued)

MARTIN, C. L.: Roentgen-ray Study of the Great Vessels. *Journal of the American Medical Association*, March, 1920, lxxiv, 723.

Excluding conditions not involving the great vessels, Martin states there are six causes of increase in width of the shadow of the great vessels, namely, chronic lesions of the mitral valve, causing a dilated pulmonary artery and left auricle; arteriosclerosis; syphilitic aortitis, which may or may not have reached the stage of aneurysm; long-continued hypertension; a high diaphragm; and a dilated pulmonary artery, such as occurs with some congenital heart.

In the normal heart silhouette, the right auricle below and the ascending aorta above (excluding the superior vena cava, which casts little or no shadow) form the right side of the shadow, while the left side is made up of the descending aorta, the pulmonary artery, the left auricular appendage, and the left ventricle. The pulmonary artery and the left auricular appendage rarely stands out so that they may be differentiated, except in disease of the mitral valve. It may be said that for persons weighing between 100 and 200 pounds the greatest distance between the right border of the ascending arch and the left border of the descending aorta on a 7-foot plate is normally between 4.5 and 6 cm.

In chronic endocarditis cases where the mitral valve is damaged, whether from stenosis, insufficiency, or a combination of the two, there results a derangement of the mechanical balance in the cardiac apparatus. The auricle and pulmonary artery finally increase in size. The left auricular appendage and the pulmonary artery may become so large that they overlie the left border of the descending aorta and extend upward to the crest of the arch. Supracardiac dullness is definitely increased to the left when this occurs.

Arteriosclerosis is primarily a disease of the intima, and consequently no great changes in the diameter of the aortic tube are to be expected. However, after fibrosis and calcification set in, there may be a derangement of the course of the tube. Especially when hypertension is present tortuosity of the aorta results. The appearance seems to suggest that the artery has increased in length. This tortuosity shows itself in the roentgenogram as an increased prominence of the aortic "knob" (that is, the portion of the ascending aorta which passes backward to the left of the spine, just before becoming the descending aorta), and in a tendency of the descending aorta to swing well to the left of its normal position. In the oblique view the upper portion of the arch may be "clubbed", but the width in the mid-portion is usually normal. Calcified plaques can be shown only very rarely.

In most cases one is probably safe in assuming syphilis to be the cause of a localized bulging of the aorta, particularly when this abnormality occurs just above the aortic valve. The roentgenogram shows a definite prominence at the base of the ascending aorta. The patient showing aortitis is usually between thirty and fifty years of age, and gives a history of infection some fifteen or twenty years pre-

viously. It is the diffuse dilatation of the arch which offers the greatest difficulties in diagnosis from the roentgenologic point of view, for syphilis is not the only condition producing a wide aortic arch. When a diffuse dilatation does occur, it should be explained on the basis of the clinical findings and the patient's story. Syphilis of the aortic arch is usually a progressive process, and it may go on to one or more of three end-points, namely aneurysm, partial or total occlusion of the coronary arteries, and sclerosis and retraction of the cusps of the aortic valve. Aneurysm, except when it occurs in some rare location, can be shown without difficulty on the roentgenogram. No direct evidence of involvement of the coronary arteries can be obtained, but when aortic regurgitation occurs, the increased length of the heart and the prominence of the curve of the left ventricle suggest its presence.

Hypertension is often spoken of as a cause of dilatation of the aorta. Wide, aortic arches were observed in a series of cases of chronic nephritis with hypertension.

The frequency with which wide arches occurred in these persons who showed no definite evidence of cardiac disease made it seem probable that obesity might be related to the width of the great vessels. After some study it became apparent that the wide arches usually occurred in the type of patient who possessed a high diaphragm, as a result of the presence of a large amount of abdominal fat. Obesity in itself probably has no influence on the width of the great vessels. This fact should be kept in mind in such conditions as pregnancy, abdominal tumor, subphrenic abscess, extensive pleural adhesions, and extreme obesity.

There are certain rare conditions in which the pulmonary artery alone is dilated; and when this occurs, the dullness extends much farther to the left than it should normally. This occurs in conditions causing an elevated blood-pressure in the pulmonary circulation, such as congenital heart, obstruction of the pulmonary circulation, and mitral stenosis.

The roentgenologist can draw some conclusions from his findings without clinical aid. The mitral type of heart, and the type presenting a dilated pulmonary artery can usually be recognized. A high diaphragm is an evident condition, especially when viewed fluoroscopically. The sclerotic arch presents a prominent "knob" and descending portion when seen anteriorly, a clubbing at the crest and

a normal width when seen obliquely. A localized dilatation indicates syphilitic aortitis. A general dilatation may be due to syphilis or hypertension. A large hypertrophied heart accompanies a widened arch, resulting from long-continued hypertension. A diffusely dilated arch, accompanied by a small, normal or slightly dilated heart, is likely to be syphilitic. After the syphilitic process has involved the aortic valve, and the left ventricle becomes hypertrophied, the general appearance resembles that caused by hypertension. In aortic regurgitation, the hypertrophy of the left ventricle is much greater than that of the right. In hypertension, both ventricles show hypertrophy to the same degree. As a result, the distance across the base of the heart, as well as the length, is increased, and a generally enlarged organ results. The heart outline in regurgitation is increased downward and to the left, but the distance across the base is not much greater than normal. This difference sometimes gives a clue to the correct diagnosis in difficult cases.

L. L. SHAPIRO.

COHN, A. E.: An Investigation of the Size of the Heart in Soldiers by the Teleroentgen Method. *Archives of Internal Medicine*, May, 1920, xxv, No. 5, p. 499.

One hundred and sixty-one healthy infantrymen, returned from overseas service, were examined by Cohn five months after the armistice. Teleroentgenograms were made and compared with the standard series of Bardeen and with the figures of similar studies of Dietlen, Schieffer and Meakins, and Smith. Cohn shows that in normal breathing the difference in the size of the heart during inspiration and expiration may be neglected. He finds that the transverse shadow of the heart is the most satisfactory measurement. Even this measurement, when compared with the weight of the patient, is so variable that it is not an entirely safe criterion in the individual case, but Cohn's averages show that the hearts of soldiers examined under the conditions mentioned are not larger than those of normal individuals.

T. HOWARD.



## SECTION ON NEUROLOGY AND PSYCHIATRY

WALTER, F. K.: Concerning the Problem of the Localization of Polyneuritis. *Zeitschrift für die gesamte Neurologie und Psychiatrie*, 1918, xliv, p. 150.

Notwithstanding the study that has been made of the subject, the origin of polyneuritis is still obscure. The author had opportunity to observe a large number of cases, and here describes 7 of them. In his conclusions he states that the positive findings in the spinal fluid are one of the most important symptoms for the localization of the disease. An absolutely constant phenomenon was a very considerable increase of the total albumin content in the spinal fluid, sometimes up to five times the normal amount; this led to the inference that this albumin increase is a result of an inflammatory process resembling that of a meningitis, and it further led to the assumption that the polyneuritis is not caused by a disease of the peripheral nerves, but that it is due to an affection of the intradural roots. In cases in which histological examinations were made, the peripheral extradural sections of the nerves were found to be within normal boundaries and the only pathological findings were small infiltration foci of the pia and the beginning degeneration of the roots, but in connection with the findings in the spinal fluid these conditions were significant. The author emphasizes the fact that it is much easier to explain the clinical symptoms, i. e. the paralysis and disturbances of sensibility and the symmetrical arrangement of these disturbances, as result of a disease process from the center than of one from the periphery. Significant in disproof of a peripheral origin of this disease is the fact that in regions where there are nerves of different character, there may be an extreme degree of paralysis without disturbances of sensibility. While there was sen-

sitiveness of nerve trunks to pressure, this fact cannot be regarded as conclusive evidence of the peripheral origin of the affections, for the same sort of sensitiveness is observed in cases which are certainly known to be poliomyelitis. The author states that in addition to the disease forms described by him as of intradural origin, there are similar forms, the peripheral character of which in both the motor and sensory disturbances is obvious, and suggests that they be designated mononeuritis or multimoneuritis, to distinguish them from the polyn neuritis. There seems to be no doubt that there are transitions between these two forms as well as combinations of them. Future research must solve the problem whether or not there are similar indefinite boundaries between polyn neuritis and poliomyelitis.

S. E. JELLIFFE.

NETTER, A.: Conclusions Drawn from an Analysis of Seventy Cases of Encephalitis Lethargica. *Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, April 1, 1920, xxxvi, No. 12, pp. 441-446.

(1) *Sex*.—Females are more frequently affected than males—41 patients of the 70 studied were women.

(2) *Age*.—The disease is much more common among adults than among children. This is a differential diagnostic point between encephalitis and poliomyelitis, since the latter usually occurs in childhood.

(3) *Mode of Life*.—This has no influence on the frequency of occurrence of this disease.

(4) *Relationship to Grip*.—None of the cases studied tends to confirm the theoretical relationship between grip and encephalitis.

(5) *Contagion*.—Even if the epidemic nature of the disease seem to indicate its contagious character, it is difficult to prove it.

(6) *Frequency of Occurrence*.—Encephalitis lethargica is now constantly increasing in frequency of occurrence over the entire world.

(7) *Types*.—At the beginning of the epidemic, the lethargic form of the disease was most frequent. At the present time, the myoclonic type is commonly seen.

S. KAHN.

MORSE, P. F., AND CRUMP, E. S.: Bacteriology and Pathology in Six Cases of Encephalitis Lethargica. *The Journal of Laboratory and Clinical Medicine*, Feb., 1920, v, No. 5, p. 275.

Fluid was aspirated from the lateral ventricles and planted on bouillon, agar, blood serum, human blood-agar, Kligler's medium, and gelatin. An organism was isolated, which is described as follows:

(1) It is a non-motile coccus, small in young cultures, as large as a staphylococcus in old cultures, with a tendency to grow in diplo and tetrad forms and to bunch in small clusters. It divides similarly to a staphylococcus in three planes, stains readily with the anilin dyes, and is Gram-positive. Pure cultures were obtained from 6 consecutive autopsies, the organism being identical in each case.

(2) In animal experiments it was found that this organism, when injected subdurally, produces a fatal lethargic state in rabbits, and that the organism is recovered from the brain in pure culture.

(3) The filtered culture produces a poison which causes a fatal lethargic state in rabbits.

(4) Evidence is offered to show that this effect was due to a poison (toxin ?) generated by the growth of the organism rather than by a filterable virus.

(5) Agglutination experiments with patients' serum, both in recovered and in sick cases, are not productive of definite results, but are strongly suggestive.

The autopsies showed no abnormal external appearances. The brain substance was much redder than normal, due to the marked over-filling of the small capillaries of the cortex. The pia was quite cloudy and looked thick and opalescent, due to a marked edema of the leptomeninges. The superficial veins were distended. The brain substance was more moist than normally. On section there was perivascular infiltration of the vessels of the white matter, especially of the caudate and lenticular nuclei, optic thalamus, pons, medulla, and posterior horns of the cord, with resulting edema and miliary hemorrhages of surrounding parts.

From the clinical standpoint, the authors think that, in spite of the profound lethargic state, the fact that the patient is often restored to normal speaks decidedly against any extensive parenchymatous

brain lesion. Degenerated brain-cells that could be diagnosed as "neurophagia," etc., probably do not recover, even if the patient lives and we cannot explain the return to normal on the basis of the presence of a destructive, degenerative lesion in the gray matter.

In short, "encephalitis lethargica" is not a true encephalitis in the sense in which we speak of general paresis or the cerebral form of poliomyelitis as examples of encephalitis, because ganglion-cell and pyramidal cell destruction does not characterize lethargic cases. But we are here dealing with a typical example of low grade "meningomyelitis," the characteristic lesions being in the meninges and white matter of the basal ganglion, pons, and upper cord. Marie, in 1890, described cases similar to encephalitis lethargica and called them "acute multiple sclerosis." From a pathologic, as well as clinical, point of view, this term has much to justify its use.

C. M. ANDERSON.

HARVIER AND LEVADITI: Experimental Study of Encephalitis Lethargica. *Bulletin et mémoires de la Société médicale des hôpitaux de Paris*, Feb. 6, 1920, xxxvi, No. 5-6-7, pp. 179-190.

The authors have made careful histologic examinations of the nervous system in a fatal case of encephalitis lethargica, and attempted some experimental inoculations. Their microscopic findings tally with those described by Marie, Tretiakoff and Marinesco.

A saline emulsion of the gray matter of a patient who had died of encephalitis, was kept on ice for two days, and then injected into the brains of 2 rabbits. One of the animals died soon after of an acute meningitis, due to some fault in technique. The other rabbit is still living and well (forty-one days after the inoculation).

Other portions of the gray matter of the patient were kept in glycerin on ice for fourteen days. A saline emulsion was then made, and injected into the brain of a monkey. With the exception of a slight elevation of temperature, this animal also remained well. Thus the inoculations produced no results.

The authors do not believe that the disease is transmitted by the nasopharyngeal route, as has been claimed by Loewe, Hirshfeld and Strauss.

S. KAHN.



BAUDOUIN, E., AND LANTUEJOUL, P.: Cerebral Softening, with Increased Cell-count in the Cerebrospinal Fluid, Simulating Lethargic Encephalitis. *Bulletins et memoires de la Société médicale hôpitaux de Paris*, Feb. 20, 1920, xxxvi, Nos. 5, 6, 7, pp. 241-243.

The patient described had an extensive deep cortical softening, which gave the three cardinal symptoms of encephalitis lethargica—persistent drowsiness, ocular disturbances, and fever. Doubt as to the diagnosis of encephalitis was raised by the fact that there was a marked increase in the cells of the cerebrospinal fluid, especially of the polynuclear type.

Usually there is not much cellular reaction in the fluid in encephalitis, and when the cells are increased in number to any great extent, they are usually lymphocytic.

Autopsy established the author's diagnosis of cerebral softening.

S. KAHN.

BARRAL, F., AND RANC, A.: The Chemistry of Taste (La Chime de le Gout). *Journal de Psychologie*, Jan., 1920, xvii, 16.

Attention is here directed to the earlier studies of Cohn who was among the first to attempt to correlate definite gustatory quantities with molecular formulæ. He differentiates (1) the chemical composition of the different substances, (2) the mutual relations of the atom, and (3) the stereochemical configuration. These factors seem to be distinguishable, although of unequal value in the differentiation. The gustatory quality seems most closely related to the general chemical formula, those substances closely analogous in structure showing greater similarity in taste. The introduction of new radicals into a molecule of sweet reaction tends to produce a bitter taste, the greater the specific gravity of the radical the more pronounced the variation in the taste. Nitration tends to destroy sweet tastes as does the introduction of halogen radicals. An alcohol radical varies according to its combination. Introduced into an amidin group, it causes a sweet taste, but with an imido-group it destroys a sweet combination. Sulphuration usually develops a bitter taste. A methoxyl introduced into an aromatic molecule causes a sweet

taste. The general laws are not yet predictable as are those known for the mixtures of sound and light vibrations. The gustatory apparatus seems to be more complex and thus far the taste differentiation laws are not completely analyzable. The author has made a noteworthy contribution to such an analysis, however.

S. E. JELLIFFE.

BRUNSER, H.: Remarks Concerning the Structure of the Brain-stem of Cetaceans with Special Reference to the Inferior Olive. *Journal für Psychologie und Neurologie*, 1919, xxiv, p. 138.

The complexity of structures in the olivary bodies of cetaceans renders it difficult to find homologues for the separate nuclei of this organ in other animal species. In the whole series of mammals a medial and a lateral olivary body must be distinguished, which correspond to the two accessory olivary bodies in human anatomy. These primary olives vary in size in different species, being largest in quadrupeds and decreasing to rudimentary bodies in primates. Further, there is a formation which increases in volume in the higher species and which, in primates, forms the principal olive. The olive of cetaceans contains, moreover, another large nucleus which is placed by earlier writers, in parallel either with the median primary olive or with the ventral accessory olive of other species, but the author thinks this is done unwarrantedly, because both the form and histological structure of this element contradict the morphological identity. This nucleus, in his opinion, is homologous with that of no other mammal, and constitutes a formation belonging distinctively to cetaceans; it possibly is not a part of the olivary system at all, but it cannot, however, be identified with any other part of the cerebellum. The peculiarities of form of the olive-complex in cetaceans is in keeping with other deviations of structure of the cerebellum, the extreme development of the lateral parts being particularly noteworthy; the construction of the vermis and hemispheres is homologous with those of no other mammals. In the author's opinion it is impossible to agree with Jelgersma who sees in the cerebellum of whales a higher evolution form.

Nor does the author agree with Jelgersma's view that the inferior olive is to be placed on an equality with the pons as a shunt-

ing station between the basal ganglia and the vermis. The pyramids in cetaceans are for the most part situated exactly between the pons and the tegmentum, thus presenting a different localization from that of the homologous element in man. The author describes the decussation of the paths in the upper cervical medulla, but leaves the question open as to the destiny of the pyramids in the spinal column after the crossing. He thinks that it is very probable that they run caudad in the anterior column of the spinal cord. In the cerebellar cortex of dolphin an outer nuclear layer is perceptible which, according to Vogt and Astwazaturow, is the material from which the Purkinje cells are constructed. Brummer believes that this idea is untenable because both the nuclear layer and the Purkinje cells are present in dolphins.

S. E. JELLIFFE.

BERSOT, H.: Variability and Organic Correlations: A New Study of the Plantar Reflex. *Schweizer Archiv für Neurologie und Psychiatrie*, 1919, v, No. 2, p. 305, and 1920, vi, No. 1, p. 37.

The "plus-minus" method used by Lipps, for comparing the augmentation and diminution of frequency with which, at different ages and in different conditions of health and disease, the various reflexes occur in relation to each other and to the general heightening or reduction of reflex excitability of the individual, is here modified by the author. Certain norms, or average values, are ascertained for the behavior of reflexes under various conditions and the author has constructed tables of these values which may be regarded as representative syndromes for different ages and conditions, and they show what combinations are likely to be encountered, for example, in hemiplegia, general paresis, etc. All these reflexes are interdependent, yet in various conditions some are augmented in activity, others are diminished or tend to disappear. There is constant evolution and transposition, which it would be difficult to follow without quantitative data. Of all the reflexes, that of the great toe is one which shows the greatest constancy in connection with certain ages and conditions, the greatest difference in frequency marking differences in physical condition, and the greatest variation in opposite directions in normal and pathological conditions. Not only

has each one of these normal and pathological reactions a character peculiar to itself, but each reaction is distinguished also by its correlation with the total reflex excitability of the individual or with the other separate reactions. We see, for example, that in pathological conditions when the whole reflex excitability of the individual is augmented, the contractions of the tensor muscles of the fascia lata, the quadriceps and the adductors tend to diminish in frequency, while in normal persons all the reactions vary in the same sense as the general reflex excitability. The extent of the region which reacts to the plantar stimulation tends to become limited in pathological subjects, while in normal ones it tends to increase in direct proportion with the heightening of the total reflex excitability. All these reflexes are encountered in pathological conditions, so that it is not the mere presence or absence of a reflex (for example of the great toe) which is of diagnostic importance, but its variation in reference to other reactions or to the whole reflex excitability of the organism; the relative frequencies constitute the characteristic symptoms of disease.

S. E. JELLIFFE.

BENARD, R.: Mild and Severe Forms of Lethargic Encephalitis. Cyto-albuminous Dissociation. *Bulletins et mémoires de la Société médicale des hôpitaux de Paris*, Feb. 20, 1920, xxxvi, No. 5-6-7, pp. 232-237.

The author calls attention to a finding in the cerebrospinal fluid of his case which he believes to be important.

It is known that there is sometimes an increase in the cell-count in the cerebrospinal fluid of patients suffering from encephalitis lethargica.

In one case, Benard found 137 cells per cu. mm. But despite the increased cell-count, the amount of albumin in the fluid was normal or less than normal. This Benard terms "*cyto-albuminous dissociation*". A similar, but reversed, condition is seen in Pott's disease, which Sicard has called "*albuminocytologic dissociation*".

S. KAHN.



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